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METHODOLOGICAL ISSUES

LAND-USE, LAND-USE CHANGE AND FORESTRY

Consolidated synthesis of proposals made by Parties

Addendum

Compilation of country-specific data and information as submitted by Parties

Note by the Chairman

CONTENTS

		Paragraphs	Page
I.	INTRODUCTION	1 - 12	2
A.	Mandate	1 - 4	2
B.	Scope of the note	5	2
C.	Approach	6 - 12	2
D.	Notation keys and abbreviations		5

Annex

I. INTRODUCTION

A. Mandate

1. The Subsidiary Body for Scientific and Technological Advice (SBSTA), at its eleventh session, requested Parties to provide submissions by 1 August 2000 with views on, or proposals for, definitions on activities under Article 3.3 of the Kyoto Protocol. It also requested Parties to indicate how and which human-induced activities will be included under Article 3.4 of the Kyoto Protocol, including modalities, rules and guidelines related to these activities and their accounting, which may include any linkages to other relevant paragraphs of Article 3 of the Kyoto Protocol, and any relevant information on these activities (FCCC/SBSTA/1999/14, para. 46 (g), (h), and (i)).

2. Submissions from Parties included in Annex I to the Convention (Annex I Parties) should further include, *inter alia*, a list of additional activities that each individual Party is proposing for inclusion under Article 3.4 of the Kyoto Protocol, as well as information on methodologies for measuring and reporting on net changes in greenhouse gas emissions by sources and removals by sinks and/or changes in carbon stocks resulting from each activity.

3. Annex I Parties were further requested to provide an assessment of net changes in carbon stocks, and changes in emissions by sources and removals by sinks, associated with the activities under Articles 3.3 and 3.4 (FCCC/SBSTA/1999/14, para. 46 (g), (h), and (i)).

4. At its twelfth session, the SBSTA agreed to a format for the submission of the country-specific data and information by Annex I Parties (hereafter referred to as "data format") called for by the SBSTA at its eleventh session (FCCC/SBSTA/2000/5, annex II). It was concluded that these formats, and the data and information, by no means prejudge decisions or conclusions that may be made by either the Conference of the Parties (COP) or the SBSTA at future sessions (FCCC/SBSTA/2000/5, para. 32 (d)).

B. Scope of the note

5. This note by the secretariat summarizes the country-specific data and information submitted by Parties. All submissions received from Parties until 15 August 2000, contained in documents FCCC/SBSTA/2000/MISC.6 and Add.1 are included in this document. Submissions that were received after this date are included in FCCC/SBSTA/2000/MISC.6/Add.2 and data and information contained by these submissions has not been incorporated into this note. For more details on the mandate, please see also sections A-D in chapter I of document FCCC/SBSTA/2000/9. The data format agreed upon at the twelfth session of the SBSTA is contained in the annex of this document.

C. Approach

6. From a total of twenty one Parties which had sent a submission, all of them provided data and/or information related to Article 3.3 of the Kyoto Protocol, 20 Parties provided data and/or information related to their carbon stocks in 1990, and 15 Parties provided data and/or information on Article 3.4 of the Kyoto Protocol (Table 1). All Parties, except one, are Parties to Annex II of the Convention.

Table 1: Overview table of data and explanatory text submitted by Parties

Party	Information related to:					
	Article 3.3		Carbon stock in 1990 (first sentence of Article 3.4)		Article 3.4	
	Data	Explanatory text	Data	Explanatory text	Data	Explanatory text
Australia	✓	1	✓	1	✓	1
Austria	✓	1	✓	1		
Canada	✓	1	✓	1, 2	✓	1
Denmark	✓	1	✓	1		
Finland	✓	1	✓	1	✓	1
France	✓	1	✓	2	✓	1
Germany	✓	1, 2	✓	1	✓	1, 2
Iceland	✓	1	✓	1	✓	1
Ireland	✓	2	✓	2		
Italy	✓	2	✓	2	✓	2
Japan	✓	1	✓	1	✓	1
Netherlands	✓	1	✓	1	✓	1
New Zealand	✓	1	✓	1		
Norway	✓	1	✓	1	✓	1
Portugal	✓					
Russian Federation	✓	2	✓	2		
Spain	✓	2	✓	2	✓	2
Sweden	✓	1	✓	2	✓	2
Switzerland	✓	2	✓	2	✓	1
United Kingdom	✓	1	✓	1	✓	2
United States	✓	1	✓	1	✓	1

✓ = Data provided, 1 = explanatory text provided according to the requested format, 2 = explanatory text provided in a modified format.

7. Parties generally followed the structure of the agreed data format (see annex), which was adopted as the structure for this document.

8. The data submitted by Parties are compiled in three sets of three tables. Tables 2 (a), (b) and (c) summarize data and information related to Article 3.3 of the Kyoto Protocol and refer to the table I in the agreed data format. Tables 3 (a), (b) and (c) summarise data and information on carbon stocks in 1990 (the first sentence of Article 3.4 of the Kyoto Protocol) and are based on the submitted data in table II of the data format. Tables 4 (a), (b) and (c) summarize data and information related to Article 3.4 of the Kyoto Protocol and refer to table III of the data format.

9. Data presented in this document are reproduced from the tables submitted by the Parties with slight adjustments to harmonize the units between Parties. Relevant sections from the explanatory text were extracted from the submissions, in support of the data, and compiled in

tables referenced as (b) and (c). These tables are based only on the explanatory text sections and do not refer to the other sections of the Parties' submissions.[1]

10. The summary does not attempt to assess or prejudge any of the provided information. The secretariat has had to use some judgement regarding which and how much explanatory information to reproduce in order to keep a clear, concise, and easily readable document. However, references in the tables indicate where additional information regarding particular subjects may be found in the miscellaneous documents, especially in the sections describing accounting approaches and methodologies.

11. **Note for all data tables**: A negative sign indicates either emissions by sources or a decrease in carbon stocks. A positive sign indicates either a removal by sink or an increase in carbon stocks.

12. **Note for textual tables**: References to the relevant parts of the miscellaneous documents are indicated in the tables when additional country-specific information is provided by the Party as only a selection of the information submitted by the Parties is presented. References to tables with roman numbering (e.g. table II), refer to tables from the Parties' submissions and can be found in the miscellaneous documents.

[1] This means that if a Party has submitted relevant data in its textual proposal (but they are not part of the data format (annex I)), they are not reported in this summary.

D. Notation keys and abbreviations

The following notations keys and abbreviations have been used:

A Afforestation
AB Activity-based
ARD Afforestation, reforestation, deforestation
C Carbon
CP Commitment period (2008-2012)
D Deforestation
GHG Greenhouse gas
IE Included elsewhere
LB Land based (LB I – Land based I; LB II – Land based II)
NA Not applicable
NR Not reported
NRS Not reported separately
Q_0A Qualitative assessment
Q_1A Quantitative assessment
R Reforestation

The following chemical symbols and abbreviations have been used:

CO_2 Carbon dioxide
N_2O Nitrous oxide
CH_4 Methane

The following units of mass have been used:

Tg Teragram (10^{12} grams)
Gg Gigagram (10^9 grams)

DATA AND SUMMARY INFORMATION RELATED TO TABLE 1 OF THE DATA FORMAT (ARTICLE 3.3. OF THE KYOTO PROTOCOL)

Table 2 (a): *Preliminary data on carbon stock changes and area related to Article 3.3 activities in Annex I Parties*

All tables 2 refer to Article 3.3 of the Kyoto Protocol. Table 2 (a) is split into 3 parts displaying country data for Afforestation (Part 1), Deforestation (Part 2) and Reforestation (Part 3), for the requested time periods, and the average annual projected carbon stock change in the first commitment period. Data are reported in this table as they are submitted by Parties with a unit adjustment to Gg grams of carbon.

Most of the Parties have indicated that they have reported for activities according to the periods "since 1990 up to 1995", "since 1990 up to 1999" and "since 1990 up to 2012". However, other Parties have indicated different periods. Any deviation from the standard reporting periods indicated in the data format are indicated in a note at the end of the table.

Table 2 (b): *Summary of information on carbon stock changes and area related to Article 3.3 activities in Annex I Parties*

This table summarises information provided by Parties in their explanatory text on accounting frameworks, methods used to provide estimates, carbon pools, stratification, projections, uncertainties and non-CO_2 gases.

Table 2 (c) *Definitions of forest, afforestation, reforestation and deforestation provided by Annex I Parties*

This table includes two parts related to the definition of a) forest and b) afforestation, reforestation and deforestation provided as currently being used by Parties. If Parties have cross-referenced their explanatory text and other parts of the submission, an indication is included in the table.

Table 2 (a) (Part 1): Preliminary data on carbon stock changes and area related to Article 3.3 activities in Annex I Parties
Afforestation (IPCC Reforestation)

Party	Definition	Accounting framework	$^{a}_{t}$	$a_{(t-20)}$	$a_{(t-x)}$	ΔC_t	ΔC_B	ΔC_{ab}	Average ΔC_{ab}
			1000 ha			Gg C			Gg C/year[4]
Australia	IPCC	LB	210.0	500.1	1 350.3	2 400.0	8 700.0	23 600.0	4 720.0
Austria[5]	IPCC/FAO	AB	88.0	103.0	238.0	483.0	936.0	1 877.0	375.4
		LB	88.0	103.0	238.0	[illegible]	[illegible]	[illegible]	[illegible]
	IPCC net[6]	AB	46.0	48.0	111.0	262.0	81.0	878.0	175.6
		LB	46.0	48.0	111.0	[illegible]	[illegible]	[illegible]	[illegible]
Canada	IPCC/FAO	AB/LB	-9.0	-15	-34.5	-500	-500	-500	-100.0
Denmark	IPCC/FAO	AB/LB	10.0	21.3	52.7	12.0	58.0	474.0	94.8
Finland	IPCC/FAO	AB	66.7	92.2	142.7	165.0	380.0	610.0	122.0
France[7]	IPCC/FAO - artificial	AB	51.1	85.1	195.8	334.0	841.0	2 510.0	502.0
	- natural	AB	453.6	756.0	1 738.7	2 767.0	7 258.0	23 373.0	1 074.6
Germany	IPCC/FAO	AB	47.0	72.8	157.1	234.0	880.0	1 108.0	216.4
Iceland	IPCC	LB	5.7	8.8	20.0	34.2	84.5	170.0	24.0
Ireland	IPCC/FAO	AB/LB	86.0	172.0	367.0	348.0	591.0	4 374.0	914.6
Italy	IPCC/FAO	AB/LB	32.5	75.1	221.9	121.0	892.0	2 365.0	473.0
Japan	FAO	AB	35.0	58.0	134.0	50.0	294.0	1 365.0	273.0
Netherlands[8]	IPCC/FAO	AB/LB	5.4	6.3	10.24-55.66	48.6	95.1	70.9-817.65	15.4-81.5
New Zealand[9,3]	IPCC	LB a)[10]	194.2	458.0	875.2	1 300.0	6 300.0	25 400.0	5 088.0
		LB b)[10]	46.9	70.8	141.7	294.6	1 100.0	3 300.0	828.0
		LB c)[10]	NR	NR	NR	NR	NR	[illegible][11] 9 000.0	1 800.0
Norway	IPCC	AB	186.5	311.0	715.0	52.0	120.0	240.0	50.0
	FAO	AB	186.0	310.0	713.0	50.0	120.0	240.0	50.0
Portugal	IPCC/FAO	AB/LB	98.0	304.0	746.0	NR	NR	NR	-
Russian Federation[3]		LB	3 199.6	2 480.3	1 547.9	NR	NR	NR	-
Spain	IPCC/FAO	LB	73.9	48.2.6	NR	44.9	293.2	NR	
Sweden	IPCC	AB/LB	69.0	NR	242.0	30.0	NR	870.0	170.0
Switzerland	IPCC/FAO	AB	0.9	1.1	2.2	2.9	1.6	16.5	3.3
	Land-use flexible	LB	23.8	NR	NR	266[illegible]	NR	NR	-
United Kingdom	IPCC/FAO	LB	116.8	183.5	401.2	555.0	1537.0	3070.0	614.0
	Other (net approach)	LB	110.8	173.5	378.2	526.0	1457.0	2918.0	583.6
United States[3]	IPCC/FAO	LB	825.0	3792.0	12754.0	[illegible]	[illegible]	[illegible]	402500.0

[a] Numbers in this column are calculated as follow: ΔC_{af}/ 5 years.

[b] Figures would be approximately the same as the corresponding afforestation, reforestation figures for IPCC, activity based, and IPCC net, activity based, respectively.

[c] IPCC definitions for ARD are used. However, afforestation, reforestation area is reduced by the deforestation area.

[d] See the definition for afforestation in table 2 (a).

[e] Because no data on soil carbon losses during deforestation are available, soil carbon is excluded. Soil carbon sequestration due to afforestation and reforestation is assumed to be very small (0,1 tC/ha/y) and not accounted, to keep similarity. This also applies for table 2 (a), part 2 and part 3.

[f] Under the IPCC definition only data for reforestation are reported. They are the same as the FAO afforestation data.

[g] The activities under afforestation/reforestation include: a) Grassland to planted forest; b) Shrublands to planted forest; c) Grassland to shrublands/forest (see FCCC/SBSTA/MISC.6/Add.1, p. 31-32).

[h] In this case, NR indicates that data are not available.

[i] Forest restoration activities include afforestation and reforestation according to State Forest Inventory data. a_{88}, a_{93}, a_{98} represent total area of forest restoration within inter-inventory period by the years 1988, 1993 and 1998 respectively.

[j] The Party reported a range of values. In this table only the medium values are presented.

a_t	Area (1000 ha) afforested and reforested, or deforested since 1990 up to 1995 or possibly an earlier specific year.
ΔC_t	Carbon stock change (Gg C) since 1990 up to the same year as used in a_t on land afforested, reforested, and deforested.
a_{tt}	Area (1000 ha) afforested and reforested, or deforested since 1990 up to 1999 or an earlier specific year.
ΔC_{tt}	Carbon stock change (Gg C) since 1990 up to the same year as used in a_{tt} on land afforested, reforested, and deforested.
a_{cp}	Projected area (1000 ha) afforested and reforested, or deforested since 1990 up to 2012.
ΔC_{cp}	Projected carbon stock change (Gg C) over the first commitment period on land afforested, reforested, and deforested since 1990 up to 2012.

Note: Data in this table summarize the estimates for the IPCC definition for A/R. FAO definitions for reforestation are given in Table 2a (Part 3).

Note: Some Parties have reported against different periods compared to the one indicated in the data format. The differences are as follows: a_t for USA is reported for the period 01/01/1990 to 01/01/1992 and a_{tt} is from 01/01/1990 to 01/01/1997. Portugal excludes 1995 data from a_{tt}. Finland and Iceland indicate that a_{tt} includes data up to 1998. For Denmark, France, Japan, Netherlands and Norway, a precision is made that the last year of each period is included in the calculation. The Russian Federation indicates provides the following indications for each periods: Total area of forest restoration within inter-inventory period by the year 1988 (a_t), 1993 (a_{tt}) and 1998 (a_{cp}). This note refers to the 3 different parts of table 2 (a).

Table 2 (a) (Part 2): Preliminary data on carbon stock changes and area related to Article 3.3 activities in Annex I Parties: Deforestation

Party	Definition	Accounting framework	a_i	a_{ii}	a_{cp}	ΔC_i	ΔC_{ii}	ΔC_{cp}	Average ΔC_{cp}
			1000 ha			Gg C			Gg C/year
Australia	IPCC/FAO	LB	2362.0	3884.0	8078.0	-68200.0	-119200.0	-57600.0	-11520
Austria	IPCC/FAO	AB	42.0	55.0	127.0	-3957.0	-5257.0	-2900.0	-580
		LB	42.0	55.0	127.0				-
	IPCC net[1]	AB/LB	0.0	0.0	0.0	0.0	0.0	0.0	-
Canada	IPCC/FAO	AB/LB	276.0	460.0	1057.0	-26000.0	-43000.0	-22000.0	-4400
Denmark[2]	IPCC/FAO	AB/LB	0.0	0.0	0.0	0.0	0.0	0.0	0
Finland[3]	IPCC/FAO	AB - Option 1	72.9	93.1	233.0	-2330.0	-2980.0	-1600.0	-320
		AB - Option 2	90.0	135.0	345.0	-2880.0	-4320.0	-2400.0	-480
France	IPCC/FAO	AB	91.5	152.5	350.7	-5124.0	-9066.0	-5625.0	-1125
Germany	IPCC/FAO	AB	14.8	25.3	60.4	-1558.0	-2660.0	-1419.0	-283.6
	IPCC/FAO (incl. Soil carbon)	AB	14.8	25.3	60.4	-2179.0	-3811.0	-2144.0	-428.8
Japan	IPCC/FAO	AB	-107.0	-148.0	-319.0	-5956.0	-8461.0	-5104.0	-1020.8
Netherlands[4]	IPCC/FAO	AB	1.3	2.2	5.1	-79.4	-132.3	-66.1	-13.22
	IPCC/FAO	LB	1.3	2.2	5.1	-78.0	-130.1	-65.0	-13
New Zealand[5]	IPCC	LB	NR	NR	NR	NR	NR	NR	NR
Norway	IPCC/FAO	AB	15.0	25.0	57.5	-140.0	-250.0	-160.0	-32
Portugal	IPCC/FAO	AB/LB	5.0	9.0	11.0	NR	NR	NR	-
Sweden	IPCC/FAO		67.0	NR	234.0	-1300.0	NR	-1300.0	-260
Switzerland[6]	IPCC/FAO/Land-use Flexible	AB/LB	0.8	1.3	3.1	-82.8	-129.3	-70.0	-14
United Kingdom	IPCC/FAO	LB	6.0	10.0	23.0	-315.0	-525.0	-261.0	-52.6
	Other (net approach)	LB	NR	NR	NR	0.0	0.0	0.0	0
United States	IPCC/FAO	LB	1096.0	4135.0	13028.0	-88000.0	-340000.0	-237000.0	-47400

[b] Absolute amount of ΔC_p would be approximately 3 % lower than the corresponding deforestation figure at IPCC FAO, AB. The figures for forest increment prior to deforestation are highly dependent on the length of the period which is taken into consideration. Therefore estimates for the LB deforestation were only estimated for the first commitment period (ΔC_{cp}) but not for ΔC_l and ΔC_u.

[c] IPCC definitions for ARD are used. However, afforestation, reforestation area is reduced by the deforestation area.

[m] Deforestation is not considered to occur at a significant scale.

[n] Option 1: Area information 1970-1998 is registered by Statistics Finland, since 2000 onwards, projected deforestation is 1 0 000 ha/a;
Option 2: Estimates are based on the previous Finnish National Forest Inventory, provided that previous deforestation rat e 15 000 ha/a would continue.

[o] No data is available to quantify deforestation in the period since 1990. The rate of deforestation is known to have been lo w in the beginning of the period and has subsequently reduced substantially.

[p] The carbon change data for deforestation were reported without a sign. It was however confirmed by the Party that the valu es have a negative sign.

Table 2 (a) (Part 3): Preliminary data on carbon stock changes and area related to Article 3.3 activities in Annex I Parties: Reforestation (FAO definition)

Party	Definition	Accounting Framework	a_t	a_u	a_{cp}	ΔC_l	ΔC_u	ΔC_{cp}	Average ΔC_{cp}
			1000 ha			Gg C			Gg C/year
Austria	FAO	AB	66.0	110.0	253.0	295.0	771.0	1635.0	327.0
	FAO	LB I	66.0	110.0	253.0	-7543.0	-12644.0	-6337.0	-1267.4
	FAO	LB II	66.0	110.0	253.0	-77.0	-201.0	-115.0	-23.0
Canada	FAO	AB	5080.0	8760.0	21030.0	-15000.0	-25000.0	-3000.0	-600.0
	FAO	LB I	5080.0	8760.0	21030.0	-250000.0	-425000.0	-226000.0	-45200.0
	FAO	LB II	5080.0	8760.0	21030.0	-132000.0	-221000.0	-115000.0	-23000.0
Denmark	FAO	AB	8.2	13.8	31.7	8.0	44.0	301.0	60.2
	FAO	LB I	8.2	13.8	31.7	-368.0	-838.0	-669.0	-133.8
	FAO	LB II	8.2	13.8	31.7	-93.0	-254.0	-185.0	-37.0
Finland	FAO	AB	951.0	1 485.0	4 285.0	1 640.0	4220.0	14 000.0	2 800.0
France	FAO -artificial	AB	241.9	408.2	938.9	230.0	928.0	8300.0	1660.0
	-natural	AB	185.3	308.8	710.3	90.0	599.0	3864.0	772.8
Germany	FAO	AB	252.0	420.0	966.0	1323.0	3456.0	6615.0	1323.0
	FAO	LB I	252.0	420.0	966.0	-33912.0	-55269.0	-22748.0	-4549.6
	FAO	LB II	252.0	420.0	966.0	-1144.0	-3004.0	-5012.0	-1002.4
	FAO II[q]	AB	420.0	700.0	1610.0	2205.0	5775.0	11025.0	2205.0
	FAO II	LB I	420.0	700.0	1610.0	-56520.0	-92100.0	-37913.0	-7582.6
	FAO II	LB II	420.0	700.0	1610.0	-1906.0	-4991.0	-8354.0	-1670.8

Table 2 (a) (Part 3) *(continued)*

Party	Definition	Accounting framework	a_i	a_{ii}	a_{CP}	ΔC_i	ΔC_{ii}	ΔC_{cp}	Average ΔC_{cp}
			1000 ha			Gg C			Gg C/year
Ireland	FAO	AB	22.0	59.0	160.0	45.0	190.0	2313.0	462.6
	FAO	LB I	22.0	59.0	160.0	-1106.0	-3313.0	-345.0	-69.0
	FAO	LB II	22.0	59.0	160.0	-79.0	-323.0	-199.0	-39.8
Japan	FAO	AB	316.0	459.0	749.0	491.0	2736.0	9102.0	1820.4
Netherlands'	FAO	AB	15.6	26.0	52.0	37.4	104.0	208.0	41.6
	FAO	LB I	15.6	26.0	52.0	-571.0	-1456.0	-468.0	-93.6
	FAO	LB II	15.6	26.0	52.0	-103.0	-676.0	-130.0	-26.0
Norway	FAO	AB	153.0	237.0	507.0	0.0	1.0	300.0	60.0
	FAO	LB I	153.0	237.0	507.0	-9400.0	-16000.0	-8900.0	-1780.0
	FAO	LB II	153.0	237.0	507.0	-1600.0	-3600.0	-3500.0	-700.0
Portugal	FAO	AB	4.0	35.0	113.0	NR	NR	NR	-
	FAO	LB I	4.0	35.0	113.0	NR	NR	NR	-
	FAO	LB II	4.0	35.0	113.0	NR	NR	NR	-
Spain	FAO	LB I	529.8	1059.5	NR	323.6	647.2	NR	-
Sweden	FAO	AB	950.0	NR	4180 (curr.)	500.0	NR	15000.0	3000.0
United Kingdom	FAO	AB	93.7	151.0	334.4	458.0	1296.0	2311.0	462.2
	FAO	LB I	93.7	151.0	334.4	-10286.0	-16386.0	-7107.5	-1421.5
	FAO	LB II	93.7	151.0	334.4	-368.4	-580.9	225.6	45.1
United States	FAO	AB	6733.0	21712.0	62966.0	75000.0	300000.0	838000.0	167600.0
	FAO	LB I	6733.0	21712.0	62966.0	-292000.0	-935000.0	-37000.0	-7400.0
	FAO	LB II	6733.0	21712.0	62966.0	-13000.0	-52000.0	453000.0	90680.0

[8] FAO II - same as FAO, but natural regeneration has been included, according to the "regeneration" definition of IBRA2000 which includes both natural and artificial regeneration.

Table 2 (b): Summary of information on carbon stock changes and area related to Article 3.3 activities in Annex I Parties

Party	Accounting framework used		Methods	Carbon pools included	Stratification	Projections	Uncer-tainty	Non-CO_2 gases treated values
	LB/AB	Additional information provided						
Australia	A, R, D - LB	This analysis was undertaken using the IPCC LB accounting framework. Australia has proposed, in the accompanying submission, two accounting subrules should be implemented for A, R and D activities under Article 3.3 to prevent discrepancies between actual and reported stock change. This analysis does not include the effects of these sub-rules in estimating changes in carbon sequestration for A, R or D activities. [MISC. 6, p. 27] [r]	Modelling of A/R emissions and sequestration was completed using the Australian Greenhouse Office's CAMFOR forest accounting model. Model parameters were drawn from relevant published literature. The models and parameters used to estimate emissions associated with D are described in the supporting methodology supplements to Australia's National Greenhouse Gas Inventory Workbook 4.2. [MISC. 6, p. 27]	Above ground biomass, litter and woody debris, below ground biomass, soil carbon and on and off site harvested materials.	A/R - based on Australia's National Plantation Inventory regions. These regions (14) are stratified by species, management regime and productivity class. D - stratified by vegetation structural classes. Areas of clearing are assigned to a vegetation class which is in turn assigned a typical soil carbon and biomass estimate.	Values and key assumptions provided.	Q_1A	NR
Austria	A, R, D - AB, LB [s] R - AB, LB I, LB II	The used accounting frameworks for AB, LB I and LB II correspond to the options given in the IPCC special report „Land-use, Land-use Change and Forestry". [MISC. 6, p. 127]	No models other than typical Forest Inventory Models (e.g. height models, models for volume) were used. Details on methodology are provided in MISC. 6, p. 128.	Above- and below-ground biomass, litter and woody debris, soil carbon, harvested materials.	Stratification according to altitude, management type of forest area, carbon uptake, age class of forests, etc. [MISC. 6, p. 128]	Values and key assumptions provided.	Q_1A	NR

Table 2 (b) *(continued)*

Party	Accounting framework used		Methods	Carbon pools included	Stratification	Projections	Uncer-tainty	Non-CO_2 gases treated values
	LB/AB	Additional information provided						
Canada	A, R, D - AB, LB (same values) R-AB, LB I, LB II	Under the IPCC definitions, it is not possible to distinguish A and R in Canada, making the distinction between the two of little practical use in Canada. Areas subject to R under a FAO-type definition are much better known. We have used a variety of assumptions, methodologies and currently available data to derive the estimates shown in Table I, but we emphasise that these approaches do not reflect the systems that Canada proposes to use to measure and monitor ARD and forest management activities. For the preliminary estimates shown in Table I we did not attempt to differentiate between AB accounting and LB accounting for D and A, given the data available at present. Therefore in Table I we do not show differences between the two types of accounting for these two activities, and we expect that in practice the differences will be small. [MISC. 6, p. 80]	A - Area based on very rough approximation using available information on urban planting, industry plantations and shelterbelts. Assumed annual afforested area for early to mid 1990s applies in 1990-2012. [MISC. 6, p. 81] R - Carbon stock change estimates derived separately for Eastern Canada using a modified version of the GORCAM model, and for Western Canada using a spreadsheet model [MISC. 6, p. 81] D - Compilation of information from a variety of sources and employing a variety of methodological assumptions [MISC. 6, p. 82]	A (and IPCC R) - only above ground biomass; R - various, depending on the approach (AB - biomass pools associated with planting or natural regeneration after harvest, plus the effects on soil and on-site vegetation of the activity in parts of the country for which estimates for these pools were available; LB II + dead biomass left on site after harvesting; LB I - LB II + harvested biomass removed from the site) D - above-ground tree biomass, litter and woody debris, below ground tree biomass and soil.	A – Due to the minimal level of afforestation activity no stratification was attempted. R - For R using a FAO-type definition, the estimates use detailed information on growth curves of tree species typically involved in regeneration in each province in Eastern and Western Canada. D - In deriving the estimates for deforestation, we stratified D areas based mainly on administrative regions (provinces) and, where possible, on forest cover type (softwood, mixwood, hardwood).	Values and key assumptions provided.	Q_1A	NR

Table 2 (b) *(continued)*

Party	Accounting framework used		Methods	Carbon pools included	Stratification	Projections	Uncer-tainty	Non-CO_2 gases treated values
	LB/AB	Additional information provided						
Denmark	A, R - AB, LB (same values) R - AB, LB I, LB II	Full carbon accounting is used for all three approaches (AB, LB I, and LB II) in a manner by which C-stock changes are based on area multiplied by uptake. Uptake is based on a simple carbon storage model based on the Danish yield tables for Norway spruce (representing conifers) and oak (representing broadleaves). Wood volumes are converted into carbon stores by a general expansion factor (2) and conversion factors of 0.19 t C/m3 for conifers and 0.29 t C/m3 for broadleaves. Decomposition rates for the various slash components and turnover rates for various wood products are included in the model (for more information see Danish Energy Agency (2000)). [MISC. 6, p. 135]	No distinction was made between AB and LB accounting, as we have no reason to believe that the cropland soils will decrease significantly in total C storage following afforestation. These models were the basis for the carbon storage model used for calculating the C storage in afforested stands during the three periods 1990-1995, 1990-1999 and 2008-2012. The carbon storage in successive generations of A areas are summed up to give the cumulated carbon storage over a certain period. R FAO AB: The carbon storage model for A (Danish Energy Agency 2000) was used to calculate carbon sequestration in trees planted on harvested forest areas. R FAO LB I: The full forest harvest and decomposing slash is included in the calculation of C storage following R. R FAO LB II: Accounting from the start of activity, but from then on decaying slash is taken into account. The carbon storage model is run from the beginning of a new planting, i.e. without including the C stock in wood of the former stand but including the release of carbon from decaying slash. [See MISC. 6, p. 136]	A, R - whole tree biomass (including roots), slash and wood products	The yield tables behind calculation of carbon stores are for yield class 2 (on a scale decreasing from 1 to 4). For A areas, a ratio between conifers and broadleaves of 1:3 was assumed, while all calculations for regeneration were done using Norway spruce as the model tree species.	Values and key assumptions provided	Q_1A	NR

Table 2 (b) *(continued)*

Party	Accounting framework used		Methods	Carbon pools included	Stratification	Projections	Uncer-tainty	Non-CO_2 gases treated values
	LB/AB	Additional information provided						
Finland	A, R, D - AB	No additional information is provided.	Detailed information on methodologies and data are provided in MISC. 6, p. 141.	Carbon pools include the whole biomass of trees including stem, branches, leaves and roots. Whole biomass carbon pools could be divided into above and below ground. Soil carbon is not included in this assessment.	This submission covers the total forest area of Finland including different types of forests.	Values and key assumptions provided.	Q_1A^1	NR
France	A, R, D - AB	[MISC. 6, p. 154]	Most of the data relevant to forests in France are provided by the National Forest Inventory which was established progressively between 1960 and 1970. [MISC. 6, p. 153]	Above and below ground biomass and soil carbon.	An administrative, as well as a stratification scheme based on the ecological region (309 for the whole country), ownership (public and private), and forest types.	Values and key assumptions provided.	NR	NR

Table 2 (b) *(continued)*

Party	Accounting framework used		Methods	Carbon pools included	Stratification	Projections	Uncer-tainty	Non-CO_2 gases treated values
	LB/AB	Additional information provided						
Germany	A, R, D - AB R - AB, LB I, LB II	A - The accounting is AB in the sense that aggregate afforestation areas as reported by the laender (federal states) are the basis for calculations and estimates. LB data from individual areas of land afforested or reforested since 1990 are not available. Accounting approaches are those described in the IPCC Special Report on Land-Use, Land-Use Change and Forestry, table 3.1, page 130-131. R - The accounting approaches under FAO II are the same as under the FAO definition, with the only difference that natural regeneration has been included, according to the "R"-definition of TBFRA2000 which includes both, natural and artificial regeneration. [MISC. 6, p. 163]	Information on methodologies and data; methods and key assumptions are provided as an annex on Afforestation, Reforestation and Deforestation [MISC. 6, p. 163]	A, R - only above-ground biomass included D - 1) above and belowground biomass only; 2) biomass and soil carbon (comprising humus layer and mineral soil from 0-90 cm).	No stratification is applied.	Values and key assumptions provided.	NR	Data on non-CO_2 gases is provided in the annex [MISC. 6, p. 177]
Iceland	A - LB	All afforested land since 1990 is included in the sum. [MISC. 6/Add.1, p. 5]	Sequestration rates are based on measurements on mature stands. Average growth rates are assumed for the rotation period. [MISC. 6/Add.1, p. 6]	Soil carbon, above-ground biomass, litter and rootmat. Life roots below the rootmat are excluded as research shows that this fraction normally yields <1% of the total carbon.	No stratification is applied.	Values are based on simple extrapolation	NR	NR

Table 2 (b) *(continued)*

Party	Accounting framework used		Methods	Carbon pools included	Stratification	Projections	Uncer-tainty	Non-CO_2 gases treated values
	LB/AB	Additional information provided						
Ireland	A, R – AB, LB; (same values) R - AB, LB I, LB II	R - LB I R takes into account carbon released by felling in the year prior to reforestation. However, carbon released from felling associated with 1990 R (which would have occurred in 1989 in the great majority of cases) is not included in a_I and a_{II}, nor is the release from 2008 R included in a_{cp}. LB II approach takes into account carbon released by harvesting residues on land following the activity. An instantaneous release of carbon from harvesting residues was assumed for calculation purposes. [MISC. 6, p. 178]	For the purpose of calculating carbon stocks it was assumed that 80% of annual planting was Yield Class 16 Sitka spruce and 20% Yield Class 4 beech (Forestry Commission yield models). The same assumption was made for reforestation. [MISC. 6, p. 178]	A, R - above ground biomass, litter and woody debris and below ground biomass.	No specific information on stratification is reported.	Only values are provided.	NR	NR
Italy	A, R - AB, LB (same values)	No additional information is provided.	Carbon budget model - see Table 3.b. [MISC. 6, p. 182]	Trees, soil, forest floor and underground vegetation.	In the estimation of changes in carbon storage over time, different types of forests: high forests (conifers, broadleaves, mixed); coppices; farm woodlands; urban forests; maquis and abandoned agricultural lands) have been considered; data are disaggregated on a regional basis.	Only values are provided.	NR	NR

Table 2 (b) *(continued)*

Party	Accounting framework used		Methods	Carbon pools included	Stratification	Projections	Uncer-tainty	Non-CO_2 gases treated values
	LB/AB	Additional information provided						
Japan	A, R, D - AB	Carbon stock changes are estimated, using yield tables to estimate stem volume as well as its change for a given period. i) Total stem volume is estimated with afforested areas by planting years, and stem volumes per hectare for the corresponding forest ages derived from the yield table, which was applied to design Basic Plan on Forest Resources. ii) Stem volume is converted to carbon weight. [see formula in MISC. 6/Add.1, p. 19]	Stem volume with expansion coefficients, and above- and below-ground biomass are estimated. [MISC. 6/Add. 1, p. 19]	Only above- and below-ground biomass Litter, humus and soil carbon not included as carbon stock.	Stem volume is derived from yield table prepared by regions, major tree species and site quality.	Values and key assumptions provided.	Q_1A	NR
Netherlands	A - AB, LB (same values) R - AB, LB I, LB II	A – IPCC. For the purpose of this assessment, we have assumed A land to be 0 ha. It is assumed that afforestation on reclaimed lands in the polders is also 0 ha. That is an underestimation. Data are available on polder areas which are afforested, but not accounted in this assessment. A – FAO. Based on and ex post evaluation of the rate of forest expansion since 1990 and forest policy aim to expand the current forest area with some 75,000 ha before the year 2020. R - AB, LB I, and LB II accounting systems have been used in this assessment according to definitions in the IPCC Special reports p. 131. D - UN-ECE/FAO (2000) report for the EU 15 countries an annual deforestation rate of 0.066%. We have applied this same annual value throughout each period (slow degradation, expansion of cities, road building etc. are going on in The Netherlands too), for more detailed data are lacking for the Netherlands [MISC. 6, p. 189]	Area multiplied by uptake factor. Details about models and key parameters used in the assessment of ARD can be found in MISC. 6, p. 191 and p. 203 (appendix A to the submission).	A, R - whole tree biomass (including roots), litter, slash and wood (products), excepts for soil carbon; D - all pools without soil carbon.	For the Dutch forest, the average carbon pools in the forest biomass and average regrowth rates are used. No further stratification, except for sampling, has been applied apart from regrowth rates for forests on agricultural lands and regrowth rates for the existing forest that is being harvested. For the subsequent periods simple assumptions were made for the regrowth rates times area per age class. We did not distinguish between forest growth rates (and soil carbon losses) on former cropland or pasture, or different soil types.	Values and key assumptions provided	<5%	NR

Table 2 (b) *(continued)*

Party	Accounting framework used		Methods	Carbon pools included	Stratification	Projections	Uncer-tainty	Non-CO_2 gases treated values
	LB/AB	Additional information provided						
New Zealand	A, R, D - LB	The National Forest Estate Description provides the basis for these estimates. This provides a precursor for the development of a LB accounting system. [MISC.6/Add.1, p. 33]	These estimates are based on New Zealands national LUCF inventory methodology. Sources and methods are fully described in New Zealands National Inventory Report (2000). [MISC. 6/Add.1, p. 33]	Above and belowground carbon pools and litter. Soil carbon not included.	The modelling method is intended to provide national estimates. Accordingly simplifications are included. Firstly, the wood density factors for the different age classes assume that all trees grow in a medium density region of New Zealand. Secondly, the model takes the weighted national crop-type as being wholly Pinus radiata, when in fact around 10% of the estate is made up of Douglas fir (5%) and other species.	Only values are provided.	25%	NR
Norway	A, R, D – AB R - AB, LB I, LB II	Our accounting approach regarding the IPCC method can be interpreted as AB, where the impact on carbon stocks is determined per unit area where the activity takes place. The changes in carbon stocks are calculated from formulas developed on the basis of estimated productivity rates in the type of area where the activity occurs as well as the size of the land areas in question. In other words, we have not calculated the carbon stock change in all pools on each land area where an activity takes place (LB approach). [MISC. 6/Add.1, p. 50]	References and explanations are provided in MISC.6/Add.1, p. 51.	above-ground (stem woods, tops and branches), below ground (stumps and coarse roots) biomass, litter and woody debris and soil carbon (as median values for carbon stocks in the O horizon plus the mineral soil for the different soil types)	In Norway mean values for carbon density, growth rates etc. are estimated on the basis of field observations and calculations of the annual growth increment.	Values and detailed information; separate projections for above ground, below ground biomass and soil carbon; trends beyond the CP.	Q_1A/Q_1A (e.g. for soil C stock change the uncertainty is supposed to be at least ± 100%)	No data are provided. Information can be found in MISC.6/ Add. 1, p. 54.

Table 2 (b) *(continued)*

Party	Accounting framework used		Methods	Carbon pools included	Stratification	Projections	Uncertainty	Non-CO_2 gases treated values
	LB/AB	Additional information provided						
Portugal[a]	NR	NR	NR	NR	NR	NR	NR	NR
Russian federation	A, R-LB	Forest restoration activities within inter-inventory period include afforestation and reforestation according to State Forest Inventory data. [MISC. 6/Add.1, p.72]		NR	Not specified	NR	NR	NR
Spain	A, R- LB	There are not global scale measurements of C, but local experimentation areas. Method of calculation is based in biomass data provided by the Second National Forest Inventory (IFN-2). This inventory has been executed between 1985 and 1995 using a square grid of 1 km that covers all the Spanish territory. According the IFN-2 data and the conversion factors calculated in forest experimental plots by the Forest Research Department of Agriculture Ministry (INIA), the dasometric values obtained are computed as biomass. Biomass data is transformed in dry matter weight and in C equivalent values, using extrapolation factors obtained in the experimental forest plots of INIA. [MISC. 6, p. 210]		Total live biomass	No specific information on stratification is reported.	NR	10%	NR
Sweden	A, R - AB; D - not specified	No specific section on the approaches is provided [MISC. 6, p. 215]	The following conversion factors were used: • 1 g d.w. = 0.46 g C • 1 m^3 wood = 0.40 Mg d.w. [MISC. 6, p. 215]	Above and below ground biomass	The inventory includes roughly 18 000 sample plots per year, systematically distributed over the whole of Sweden	Values and key assumptions provided	Q/A	There are preliminary estimates in the textual part

Table 2 (b) *(continued)*

Party	Accounting framework used		Methods	Carbon pools included	Stratification	Projections	Uncer-tainty	Non-CO_2 gases treated values
	LB/AB	Additional information provided						
Switzerland	A, R - AB; D - AB, LB (same values)	Comment to the difference in A between IPCC/FAO and Land-use/Flexible Scenario: The difference is due to the area with natural regeneration. The high removal under the flexible or the land-use scenario could be interpreted as an argument against these scenarios. But it should be taken into account, that by including areas with natural regeneration the area under control of the Kyoto Protocol could be augmented. It means that emissions at a later stage would be counted as a debit to the assigned amount of a Party at least with a LB approach, which we support. Otherwise neither emissions nor removals would not controlled. The influence of AB and LB on deforestation figures seems to be negligible [MISC. 6/Add.1, p. 74]	No specific information on method is provided.	Biomass only	No specific information on stratification is reported.	Only values are provided.	Q/A A, R – medium to high D - high	NR

Table 2 (b) *(continued)*

Party	Accounting framework used		Methods	Carbon pools included	Stratification	Projections	Uncer-tainty	Non-CO_2 gases treated values
	LB/AB	Additional information provided						
United Kingdom	A, R, D - LB; R - AB, LB I, LB II	A, R in IPCC approach: For Great Britain (GB - England, Scotland and Wales) is the area each year published by the Forestry Commission (FC) to have been approved for planting grant plus the new area actually planted by Forest Enterprise (FE - state forest organisation). For Northern Ireland, both state and private new planting is published by the Dept. of Agriculture for Northern Ireland (DANI). A - FAO approach is same as for IPCC. R - FAO approach: The area of land recorded by the FC (GB - private) and FE (GB - state) and DANI (NI – state & private) as being restocked after recent clear felling for production purposes and includes natural regeneration. D - Change in land-use from forest to non-forest. Other (net approach) uses same model as IPCC approach (see below) but areas of A plus R are reduced each year by the amount of D for broadleaf or conifer before changes in carbon pools are estimated. R – FAO LB I: includes (loss of old forest carbon due to felling + loss of slash/litter carbon from old forest + gain of carbon in new forest) ; FAO LB II includes (loss of slash/litter carbon from old forest + gain of carbon in new forest); FAO AB includes (gain of carbon in new forest) [MISC. 6, p. 222]	A, R - Estimates of changes in carbon pools due to A and R use the C-Flow model of Dewar & Cannell (1992). All conifers are assumed to Sitka spruce Yield Class 12 or 14 (NI) and broadleaves beech Yield Class 6. D - the lost tree carbon pool is assumed to be the long run time-averaged equilibrium values in the C-Flow for Sitka Spruce and beech forests. R - FAO approaches, the clear felled forest is assumed to contain twice the carbon as these equilibrium values (since they would be at maturity) and decay of litter and woody debris from the felled forest occurs at the rates estimated by the C-Flow model. Deforestation rates are not well known, hence a representative conversion rate to non-forest of 1000 ha y-1 in total for the UK is used for all years. This is under review. [MISC. 6, p. 222]	A/R - above ground biomass, litter and woody debris, below ground biomass, soil carbon; D - above and below ground biomass, litter and woody debris.	Forestry data is stratified by broadleave and conifer forests for state and private sectors in each of the 4 administrative regions of UK.	Values and key assumptions provided.	(± 15%)	NR

Table 2 (b) *(continued)*

Party	Accounting framework used		Methods	Carbon pools included	Stratification	Projections	Uncertainties	Non-CO_2 gases treated values
	LB/AB	Additional information provided						
United States	A, R, D – LB R – AB, LB I, LB II	The accounting approaches used to construct data in Table 1 are those described on p. 147 the IPCC Special Report: LB I, LB II, and AB. [MISC. 6/Add. 1, p. 110]	The carbon budget of forest ecosystems of the United States is estimated using a core model, FORCARB, and several subroutines that calculate additional information, including carbon in wood products. [MISC. 6/Add. 1, p. 110]	Live tree biomass including roots; - Organic soil carbon to a depth of one meter; - Forest floor mass, which may include fine twigs; - Understory carbon, which is live biomass of shrubs, seedlings, and herbaceous plants; - Coarse woody debris and logging residue; - Carbon that goes into wood products and landfills. Carbon in dead wood in the forest is not currently included; estimates of this pool are under construction.	Multiple strata were used that include: ❑ Three owner groups - public, nonindustrial private, and forest industry; ❑ Six U.S. regions - Southeast, South Central, Northeast, North Central, Rocky Mountain, and Pacific Coast; ❑ Sixteen forest types; ❑ Two management intensities - plantation and natural; ❑ Four land-uses - forest, agriculture, pasture, and urban/developed.	Values and key assumptions provided; trend beyond the first commitment period.	Q_1A / Q_2A; (80% confidence interval)	No data provided Information in MISC. 6/ Add. 1, p. 116]

[a] All references are made to the following documents: FCCC/SBSTA/2000/MISC.6 and FCCC/SBSTA/2000/MISC.6/Add.1

[b] There are no values for the carbon changes using LB approach, but indications are given that values for afforestation/reforestation would be approximately the same as in the AB approach, and 3% lower compared to the AB approach for deforestation.

[c] A –land area (error +/-5%); R – land area (error +/-5%), each reforestation project (error +/-10%); D - land area (error +/-5%), deforestation rate (error +/-7%)

[d] Only data are provided.

Table 2 (c): Definitions of forest, afforestation, reforestation and deforestation provided by Annex I Parties
Part 1: Forest

Party	Forest
Australia	Under Australia's approach to afforestation, reforestation and deforestation, there is no need for a stand-alone definition of a forest.
Austria	"Forestry land" according to the Austrian Forestry Act is an area stocked by trees (a list of tree species in this context is given in an annex to the Austrian Forestry Act), if the stocking of trees represents an area of at least 1000 m^2 and is of an average width of at least 10 m. Forest areas, which are unstocked due to forest management practices (for instance harvesting areas or areas used for timber storage, skidding tracks or forest roads), are still referred to as "forestry land" according to the Austrian Forestry Act. The Austrian Forest Inventory always used the same definitions as the forest act except the minimum area for forest with 500 m^2 instead of 1000 m^2. Therefore the data provided refer to the minimum area of 500 m^2.
Canada	Parties may define forest in accordance with their own circumstances and must take into account published definitions. Parties may choose to use different definitions of forest to account for different forest types in their country. The definition or definitions must be used consistently in the accounting in the first and subsequent commitment period. Parties shall provide information on the source and suitability of their definitions under Article 7. Their definitions shall be reviewed in accordance with Article 8 of the Protocol. [1]
Denmark	The definition of forest in Denmark is as follows (Statistics Denmark 1994): 1) areas supporting a stand that now or later may produce wood or other forest products, and 2) fields planted to Christmas trees and greenery (max. 10% of the area of each forest district). Orchards, parkland, willow scrub, windbreaks etc. are not included in the forest area.
Finland	The international definition of forestry land, as applied in the UN/ECE-FAO Temperate and Boreal Forest Resource Assessment 2000, sets a 10% canopy cover as the threshold between forestry land and other lands. According to the Finnish system, forestry land is grouped into three classes according to site productivity: (i) Forestry land, where the potential annual increment is at least 1 m^3/ha/a; (ii) Scrub land (unproductive forestry land), where the potential annual increment is between 0.1 - 1.0 m^3/ha/a; (iii) Waste land, unless naturally treeless, products less then 0.1 m^3/ha/a, and (iv) other forestry lands, mainly roads, depots, etc.
France	According to the definitions of the French National Forest Inventory, forests are formations of trees and shrubs, included in an established list of forest species, with a crown cover of more than 10% of the land and an area of more than 0.05 ha; the canopy of such formations must be wider than 15 m. Young stands with at least 500 seedlings / ha (or 300 seedlings / ha for widely spaced artificial plantations) are also included under forests.
Germany	A Forest in the meaning of the Federal Forest Act (Article 2) is "any area of land stocked with forest plants. Forest also includes clear-cut or thinned areas of land, forest roads, forest marking-off-and safety strips, gaps in the forest cover as well as clearings, forest meadows, game feeding points, timber yards and other areas connected with forests and ancillary to them. Smaller lots plated with individual clusters of trees, lines of trees or hedges or serving as forest nurseries and being situated on farmland or within built-up areas are not forests in the meaning of the Federal Forest Act".
Iceland	Land area with trees.
Japan	Land with trees and/or bamboo growing in a group, and/or land provided for collective vegetation of trees and/or bamboo (Article 2.1, the Japanese Forest Law).
Netherlands	Land with tree crown cover (or equivalent stocking level) of more than 20% and area of more than 0.5 ha. Trees should be able to reach a minimum height of 5 m at maturity in situ. Furthermore, in The Netherlands a forest must have a minimum average width of 30 meters. May consist of closed formations where trees of various stores and undergrowth cover a high proportion of ground or open forest formations with a continuous vegetation cover in which tree crown cover exceeds 20%. Young natural stands and all plantations established for forestry purposes which have yet to reach a crown density of 20 percent or tree height of 5m are included under forest, as are areas normally forming part of forest area which are temporarily unstocked as a result of human intervention or natural causes but which are expected to revert to forest. The Dutch forest law requires a tree crown cover of 20%, whereas the UN-ECE/FAO (2000) compilation of national forest inventory data uses only 10%. Dutch forest area statistics according to the 10% crown cover limit are not available.

Table 2 (c) *(continued)*

Party	Forest
New Zealand	Forest is not defined in legislation in New Zealand, nor is there a single agreed definition that is applied in practice or in other international forestry reporting. Rather "forest" is commonly regarded to involve three broad constructs: - natural, or indigenous, forests with substantially closed canopy and often dense understory. This forest is substantially in public ownership managed for conservation and watershed protection. - planted forests established for timber and wood products purposes; - regenerating natural shrublands and successional forests.
Norway	Norway follows the FAO definition where forestry land is defined as an area with a minimum of 10 % crown coverage. The trees should be able to reach a minimum height of 5 meters at maturity. The area can be temporarily without crown coverage due to harvesting.
Russian Federation	In general Russian Federation agrees with the definition of forest proposed by FAO/IPCC in the LULUCF SR.*
Sweden	Forestry land according to the Swedish Forestry Act is all land that i) is not used for other purposes than wood production, and ii) that may support an average stemwood production exceeding 1 m^3 per hectare per year. Recently abandoned farmland is therefore forest even if no active afforestation yet has taken place. However, according to the Forestry Act, action must be taken to provide sufficient tree plant density within a few years, unless the land is again used for other purposes. Land that has a stemwood production exceeding 1 m^3 per hectare per year but which has another active land-use than forest management is thus not forest. This could be e.g. pasture, built-up land, and preserved areas.
Switzerland	National forest inventory: Crown cover at least 20 %, top height at minimal 3 m and width of the area at least 25 m. Forest Law: Area at least 200 m^2, width at least 10 m and tress must be 10 years old.
United Kingdom	Forest is that planted land recorded in national surveys, the state forest sub-compartment database and private land receiving planting grants. This may include access roads and tracks but excludes nursery areas, land with buildings etc.
United States	Land currently growing forest trees of any size with a total stocking value of at least 16.7 (10 base 100 in the West), or lands formerly forested, currently capable of becoming forestry land, and not currently developed for nonforest uses. These lands must be a minimum of 1 acre in area. Roadside, streamside, and shelterbelt strips of timber must have a crown width of at least 120 feet to qualify as forestry land. Unimproved roads, trails, streams, and clearings within forest areas are classified as forestry land if they are less than 120 feet wide. Recently clear-cut areas that are currently nonstocked are classed as forestry land unless they are being used for a nonforest use such as agriculture. Forestry land is divided into two categories (timberland and other forestry land), and both of these categories may be further classified as reserved if harvesting of trees is prohibited by statutory or administrative restrictions. The minimum stocking level of 16.7 percent is approximately equivalent to 10 percent crown cover once trees are well established. The U.S. definition of forest is compatible with the FAO definition of forest, which also used by IPCC.

' This definition is taken from the textual proposal of Canada.

* This statement is taken from the textual proposal of the Russian Federation.

Part 2 (c): Afforestation, reforestation and deforestation

Party	Afforestation	Reforestation	Deforestation
Australia[4]	Afforestation is defined as the direct human induced establishment of new forests (trees and woody vegetation) on lands which historically have not contained forests. New forests established by afforestation must cover a minimum area of 1 hectare with a minimum stand width of 10 metres. Potential canopy cover at maturity under current management practices is not less than 20%.	Reforestation is defined as the direct human induced establishment of forests (trees and woody vegetation) on lands which historically have previously contained forests but which have been converted to some other use. Prior to reforestation, the land must have been under some non-forest use for a period of not less than 5 years. New forests established by reforestation must cover a minimum area of 1 hectare with a minimum stand width of 10 metres.	Deforestation will be accounted when the proportion of canopy cover per hectare on a given area of forested land (land with trees and woody vegetation) is reduced by 30% or more through forest conversion as a result of direct human induced removal of trees. Deforestation is defined as direct human induced forest conversion which is frequently accompanied by burning. This does not include harvesting or other practices which occur as part of ongoing commercial forestry. Forest conversion means the transition of forested land to non-forested land as a result of direct human induced removal of trees.
	To be directly human induced, afforestation and reforestation must result from a deliberate human action or intervention. Establishment includes all deliberate human induced activities to establish trees including: direct planting, artificial seeding, site preparation (fire or mechanical) and protective fencing.		
Austria[5]	• A and R areas (IPCC definitions) and A areas (FAO definitions) used for the calculation of the provided data include areas of artificial planting and natural A/R (e.g. due to abandonment of agricultural lands). • Afforestation, reforestation according to IPCC definitions cannot be separated by the Austrian Forest Inventory. Both include land-use change from other uses to forests. We therefore used the figures for af-, reforestation according to IPCC as figures for afforestation according to FAO definitions.		The Austrian Forest Inventory uses a minimum area of 500 m^2 for accounting an area as forest. In addition, a minimum crown coverage of 30 % is necessary that the Austrian Forest Inventory accounts an area as afforested (according to FAO) or af-, reforested (according to IPCC). Less than 30 % crown coverage are necessary to account an area as deforested. However, deforestation according to the accounting rules of the Austrian Forest Inventory needs a land-use change (or unsustainable forest management, eg no regeneration during a long period after harvesting or other losses of the stands). Although young stands may have a lower crown coverage they have been counted as af-, reforested area (IPCC, FAO) as long as the given number and distribution of trees of these stands is sufficient to reach 30 % crown coverage in a mature state.
		The used area for reforestation according to FAO corresponds to the areas of clear-fellings with a size of more than 500 m^2. Clear-felling according to the Austrian Forest Inventory means harvest of the whole forest stock (stemwood).	
Canada[6]	Afforestation is a change in land-use that, through the establishment of a stand of trees, forms a forest.	Reforestation is a land-use practice that, through the establishment of a stand of trees, forms a forest.	Deforestation is a land-use change that removes a forest.

Part 2 (c) *(continued)*

Party	Afforestation	Reforestation	Deforestation
Denmark	*IPCC*: It is not possible to separate the Danish A area according to IPCC's definitions on A and R. Most of the A land fulfil the requirements for IPCC's definition of A, as they were cleared of forest 800-1240 A.D. and used continuously for agriculture since then (Nature of Denmark, 1980).		*IPCC/FAO*: Conversion of forest to non-forest. Deforestation is not considered to occur in Denmark to any significant extent. As the forest cover area is quite limited at present, activities like road construction very seldom result in significant deforestation of forest areas.
	FAO: Artificial establishment of forest on lands that did not carry forest within living memory. This definition applies to the total Danish afforestation area.	*FAO*: Artificial establishment of forest on lands that carried forest before, i.e. planting following clearcutting.	
Finland	Definitions of FAO and IPCC on afforestation , reforestation and deforestation are used in this assessment. It is assumed that IPCC's afforestation and reforestation equals to afforestation of FAO.		For deforestation, it is assumed that deforestation is same for both IPCC and FAO definition.
France	Afforestation is a land-use change from non-forest to forest; it can be either "natural" (i.e., by natural seeding of land where previous non-forest use has been discontinued) or "artificial" (i.e., by planting or seeding).	Reforestation is establishment of forest on lands that had them before; it can be either "natural regeneration" (i.e., by natural seeding from trees either left on the land for that purpose or from trees on neighbouring land) or "artificial regeneration" (i.e., by planting or seeding).	Deforestation is a land-use change from forest to non-forest.
Germany	Afforestation (and Reforestation under the IPCC-definition) is defined as establishment of forest on non-forestry land.	Reforestation is defined, according to the FAO-approach, as artificial regeneration of land that was previously forested (post-harvest and post disturbance regeneration) by planting or seeding.	Deforestation is defined as the conversion of forest to non-forest (= to another land-use).
Iceland	Planting trees on previously treeless areas.		
Ireland	Afforestation is land approved for planting grants by the Forest Service. This includes Coillte (Irish Forestry Board) planting.	• Reforestation (FAO definition) is land regenerated (by planting in all cases) one to two years after final felling by Coillte and the private sector. • Land based I reforestation takes into account carbon released by felling in the year prior to reforestation. However, carbon released from felling associated with 1990 reforestation (which would have occurred in 1989 in the great majority of cases) is not included in a_I and a_{II}, nor is the release from 2008 reforestation included in a_{cp}. • In the case of reforestation, the land based II approach takes into account carbon released by harvesting residues (estimated to be 7 t C ha^{-1}) on land following the activity. An instantaneous release of carbon from harvesting residues was assumed for calculation purposes.	Deforestation represents a small area of land taken out of forest for house construction or road building.

Part 2 (c) *(continued)*

Party	Afforestation	Reforestation	Deforestation
Japan	Artificial establishment of forest on lands that were not historically forest	Artificial establishment of forest on lands that had them previously (including regeneration post harvest)	Conversion of forest to non-forest.
Netherlands	*IPCC*: "Planting of new forests on lands that historically have not contained forests". If afforestation were defined as "land that did not have forest for 50 years" (as in the EU proposal), then IPCC afforestation would comprise almost the same number as we report under "FAO reforestation" *FAO*: "Artificial establishment of forest on lands that previously did not carry forest within living memory."	*IPCC*: "Planting of forests on lands that have previously contained forests but that have been converted to some other use." The definition of '*Reforestation IPCC*" in the Netherlands leads to similar results as '*Afforestation FAO*'. *FAO*: "Artificial establishment of forest on lands that carried forest before".	*IPCC/FAO*: Conversion of forest to non-forest.
New Zealand	In a practical sense afforestation and reforestation in New Zealand conditions may be considered to be largely synonymous.		The conversion of forest land to some other use
	The establishment of forests on lands which, historically, have not contained forests	The establishment of forests on lands which, historically, have previously contained forests but which have been converted to some other use	
Norway	Afforestation in Norway will normally be defined as establishment of forests by planting, seeding or other changes in human land-use practises on areas not defined as forests in the National Forest Inventory. Areas defined as afforested in Norway have been non-forest land for about 50 years or more.	Reforestation will normally be defined as re-establishment of forests by planting, seeding or natural revegetation on previously forested land or other wooded land. After harvesting all forests in Norway will be regenerated either by planting or by natural regeneration as part of the normal forest management system. The following are our understanding of the different definitions of reforestation from the IPCC Special Report on LULUCF. *FAO – LB I:* Carbon stock changes are accounted on all lands reforested (regeneration after harvesting) between 1990 and 2012. Accounting is beginning on 1 st January 2008. On lands reforested between 2008 and 2012 (the commitment period) harvesting will be accounted as a carbon emission. [bb] *FAO – LB II:* Like land based I, except for emissions from harvesting, which is not included in the carbon change accounting. All other carbon changes on the reforestation area are accounted. *FAO – AB:* Only carbon changes directly related to the reforestation activities are accounted. [cc] *IPCC:* Only changes in carbon stock on lands that previously have been used for other purposes and then converted back to forest are accounted.	Deforestation should be defined as converting forestry lands to other land. For Norway such a definition would include conversion of forests to agricultural land and roads, housing and other urban areas. Normal harvesting as part of a forest management system should not be defined as deforestation. [aa]

Part 2 (c) *(continued)*

Party	Afforestation	Reforestation	Deforestation
Russian Federation	Afforestation is artificial establishment of forest on land that was previously under different land-use. The different types of land-use are: agriculture, peat extraction, mining, and others.	Reforestation is artificial establishment of forest on land that at present are not covered by forest or their forest cover is insufficient. These lands include sparsely forested territories (with low density forest cover), areas of formet forest fires, dead (or declining) stands, harvesting areas, and large glades (or other open sites) in forests.	Deforestation is artificial conversion of forested lands to non-forest territories as a result of various human activities including unfavorable anthropogenic impacts (human-induced forest fires, industrial pollution, etc.).
Sweden	A/R: Area classified as farmland in the inventory 1988-1992 and as forestry land in the inventory 1993-1998 divided by 5.5 yr. multiplied with 5 yr. Afforestation and reforestation cannot be separated. To some extent is included land on which farming will be applied again - see ii, and land which has been used for forest management shorter than 20 years ago. Thus, the A. area is subtracted from the expected afforestation area during 1995-2012.		Forest to farmland: Area classified as forestry land in the inventory 1988-1992 and as farmland in 1993-1998 divided by 5.5 yr. and multiplied with 5 yr. This is to a high extent land that has been abandoned for only a few years or land on which the present land-use was difficult to determine at either inventory. Clearing of mature forest in purpose to extend cultivation or grazing is non-significant today. Forest to roads, etc: Net conversion from forestry land to roads, railway and power line clearings between 1988-1992 and 1993-1998. Forest to built-up land: Net conversion from forestry land to built-up land between 1988-1992 and 1993-1998. In many cases, a high tree density (canopy cover) remain after the conversion (> 10 %), and in other cases, the tree density was low before the conversion.
		Area on which reforestation (regeneration) has followed upon forest harvesting, i.e. all clear-cut area.	
Switzerland	The change from non-forest to forest. Afforestation and reforestation are not differentiated in the Swiss forest law.	It has to be cleared whether some deforestation according to the Swiss law are deforestations according to the KP definitions, because they are "reforested" within a few years.	Any other use of a forested area, even it is only for a limited time period needs a deforestation authorisation.

Part 2 (c) *(continued)*

Party	Afforestation	Reforestation	Deforestation
United Kingdom	Afforestation & Reforestation in IPCC approach: For Great Britain (GB - England, Scotland and Wales) is the area each year published by the Forestry Commission (FC) to have been approved for planting grant plus the new area actually planted by Forest Enterprise (FE - state forest organisation). For Northern Ireland, both state and private new planting is published by the Dept. of Agriculture for Northern Ireland (DANI). Afforestation for FAO approach is same as for IPCC.	Reforestation for FAO approach: The area of land recorded by the FC (GB – private) and FE (GB - state) and DANI (NI – state & private) as being restocked after recent clear felling for production purposes and includes natural regeneration.[dd]	Change in land-use from forest to non-forest
United States	"Afforestation" and "deforestation" are defined primarily as land-use changes, but to qualify as deforestation the land must also meet the definition of forest prior to deforestation, and to qualify as afforestation the land must meet the definition of forest after afforestation. There is no difference in the definition of these terms for our calculations related to the IPCC or FAO definitions under Article 3.3.	In applying the IPCC definition of reforestation, the distinction between reforestation afforestation is arbitrary. Therefore, for the IPCC approach, afforestation and reforestation are treated as one activity. Forestry land in the U.S. is rarely cleared for nonforest use and subsequently returned to forest. In applying FAO definitions for the purpose of these illustrative calculations, reforestation has been interpreted to include heavy partial harvesting followed by regrowth of a new forest stand.	See definition for "afforestation"

[x] These definitions are taken from the textual proposal of Australia

[y] The definitions used for ARD are rather similar to the ones of the IPCC Scenario and "FAO Scenario given in the IPCC special report 'Land-use, Land-use Change and Forestry" (*4*) (Table 3-4, p. 142 ff.).

[z] These definitions are taken from the textual proposal of Canada.

[aa] All carbon stock changes, also carbon in soils, due to the defined deforestation activities are included. All standing biomass is accounted as emissions at conversion time. Carbon loss from soil is supposed to be increasing.

[bb] The wood removed from the forest (timber) will be accounted as emissions at harvest time. Slash and roots are accounted as emissions at a given rate of decay. Carbon changes in soil, slash and roots on the reforested area after harvesting are accounted. Slash and roots will be accounted as emissions at a given rate of decay. Accumulation of slash C in soil on reforestation areas is not accounted for, as it is difficult to predict how quickly the slash C will be incorporated in the soil C pool.

[cc] This means that we have estimated the carbon sinks due to the growth of the new forest, and the expected carbon changes in soil that occur as a result of the development of young forest stands. The changes that would take place if the area was not replanted, for example decaying slash and changes in carbon soil, are excluded. For the soil C, Activity based includes only C from litterfall, which will be negligible during the first 22 years after planting (1990-2012).

[dd] Within the FAO approach for Reforestation the following processes are included: FAO Land Based I includes (loss of old forest carbon due to felling + loss of slash/litter carbon from old forest + gain of carbon in new forest); FAO Land Based II includes (loss of slash/litter carbon from old forest + gain of carbon in new forest) and FAO Activity I includes (gain of carbon in new forest).

DATA AND SUMMARY INFORMATION RELATED TO TABLE II OF THE DATA FORMAT (FIRST SENTENCE OF ARTICLE 3.4. OF THE KYOTO PROTOCOL)

Table 3 (a): *Preliminary data on carbon stocks and area estimates for 1990 in Annex I Parties*

These data are relevant to the first sentence of Article 3.4 of the Kyoto Protocol. The table compiles data on carbon stocks in 1990 (or another year as indicated in a footnote). The indication IE (included elsewhere) means that the data are included in another land system category in the table as indicated by a footnote.

Table 3 (b): *Summary of information on carbon stocks and area estimates for 1990 in Annex I Parties*

This table compiles extracts from the explanatory text and information provided by Parties on their carbon pools and carbon stocks, methods used to provide estimates, and uncertainties.

Table 3 (c): *Definition of land systems provided by Annex I Parties in their country data submissions*

Relevant definitions for activities related to carbon stocks changes on forestry lands, agricultural lands, range lands, wetlands, tundra and other lands are provided in this table.

Table 3 (a): Preliminary data on carbon stocks and area estimates for 1990 in Annex I Parties

Party	FORESTRY LANDS			AGRICULTURAL LANDS			RANGELANDS/ GRASSLANDS			WETLAND/ TUNDRA			OTHER			TOTAL		
	Area	Carbon stock		Area	Carbon stock		Area	Carbon stock		Area	Carbon stock		Area	Carbon stock		Area	Carbon stock	
		Soil carbon[a]	Total		Soil carbon[a]	Total		Soil carbon[a]	Total		Soil carbon[a]	Total		Soil carbon[a]	Total		Soil carbon[a]	Total
	1000 ha	Tg C		1000 ha	Tg C		1000 ha	Tg C		1000 ha	Tg C		1000 ha	Tg C		1000 ha	Tg C	
Australia	145 000	NRS	13 157.0	45 000.0	NRS	1 297.0	564 000	NRS	10 484.0	2 000.0	NRS	571.0	6 000.0	NRS	262.0	**762 000.0**	**NRS**	**25 771.0**
Austria[b]	3 893	459	782	1 502.0	87	92	1 993.0	194	198	0.0	0	0.0	998.0	52	54.0	**8 386.0**	**792**	**1,126**
Canada[c]	418 000	NRS	86 000.0	45 500.0	NRS	6 000.0	15 500.0	NRS	IE	148 000	NRS	>205 000	NRS[d]	NRS	NRS	**>627 000**	**NRS**	**>297,000**
Denmark	417	NRS	77.7	2 788.0	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	**NR**	**NR**	**NR**
Finland	26 300	1 040	6 530.0	3 000.0	NR	NR[e]	NR	NR	NR	IE[f]	IE[f]	IE[f]	1 200.0	NR	10.7	**30 500.0**	**NR**	**6 540.7**[g]
France	18 282.9	NRS	2 207.0	16 473.3	NRS	785.0	13 700.6	NRS	822.0	1 790.8	NRS	60.9	4 671.5	NRS	77.4	**54 919.1**	**NRS**	**3 952.3**
Germany	10 740	NRS	2 290.0	14 292.0	NRS	1 200.0	5 251.0	NRS	622.0	NA	NA	NA	1 012.0	NRS	85.0	**36 005.0**[h]	**NRS**	**4 764.7**[h]
Iceland	150	NRS	62.0	130.0	NRS	52.0	4 097.0	NRS	1 229.0	860.0	NRS	774.0	3 823.0	NRS	32.0	**9 060.0**	**NRS**	**2 149.0**
Ireland[i]	400	122.2	136.1	400.0	27	28.3	4 500.0	564.3	582.3	1 400.0	1 597.6	1 599	0.0	1.1	1.1	**6 700.0**	**2 312.2**	**2 346.8**
Italy	9 973.9	NRS	810.8	12 678.3	NRS	560.4	4 106.1	NRS	298.1	NR	NR	NR	NR	NR	NR	**26 758.2**	**NRS**	**1 669.3**
Japan	25 212	NR	1 420.9	5 243.0	NRS	258.1	IE[j]	NR	IE[j]	NR[c]	NR	NR[c]	69.6	NR	0.025	**30 524.6**	**NR**	**1 679.0**
Netherlands	339	NRS	64.4	909.0	NRS	45.5	1 097.0	NRS	109.7	22.4	NRS	33.6	1 029.6	NRS	10.3	**3 397.0**	**NRS**	**263.5**
New Zealand[k]	10 497.5	NR[k]	1 575.5	10 384.2	NR[k]	NR	3 639.5	NR[k]	NR	114.5	NR[k]	NR	1 643.3	NR[k]	NR	**26 688.8**	**4 684**[k]	**NR**
Norway	8 600.0	1 100	1 400.0	1 000.0	200	200.0	NA[l]	NA[l]	NA[l]	IE[l]	NR	IE[l]	3 400.0	500	500[m]	**13 000.0**	**1 800**	**2 100.0**
Russian Federation	1 182 600.0[n]	NR	38 600.0 [n]	131 800.0	NR	NR[n]	80 100.0	NR	NR[n]	NR	NR	NR	NR	NR	NR	**1 394 500.0**	**NR**	**NR**[n]
Spain	13 905.0	NR	237.7	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	**NR**	**NR**	**NR**
Sweden	22 910.0	NRS	2 800.0	3 140.0	NRS	230.0	500.0	NRS	45.0	4 600.0	NRS	4 500.0	9 930[o]	NRS	28	**41 080.0**	**NRS**	**7 603.0**
Switzerland	1 210.0	110	238.6	40.3	20.1	NR[q]	1 194.6	108.0[q]	NR	273.0[p]	NR	NR	NA	NA	21.5	**2 717.9**	**NR**	**388.3**
United Kingdom[r]	2 635.2	591.1	685.8	4 824.6	969.3	974.1	7 179.2	1718.3	1 725.3	6 912.5	6913.7	6 925.2	2 203.3	31.9	32	**23 754.8**	**10 224.2**	**10 342.4**
United States[s]	198 611	NRS	36 203.0	168 127.0	NRS	12 454.0	270 830	NRS	20 943.4	13 968.0	NRS	4 714.2	75 153.0	NRS	4 163.3	**726 689.0**	**NRS**	**78 477.9**

[a] It should be noted that separate reporting of soil carbon was not required by the data format (Annex I). This column was included with the purpose of presenting the information, when Parties have reported it. NRS indicates that carbon soil was not reported separately.
[b] Uncertainty ranges for the carbon stocks in different land systems provided in the submitted table are reported.
[c] Carbon stock for agricultural lands and rangelands is reported as one estimate, which is given under agricultural land heading.
[d] Canada reports 210 000 ha of tundra in its explanatory text with additional information of the uncertainty of the data.
[e] In this case NR indicates that data are not available (Finland) or not estimated (Japan).
[f] Data are included under "forestry land".
[g] The total is not complete. Only data for wooden products in Finish building are included under "Other". Different estimates for the total carbon stock in 1990 vary between 6200-7700 Tg C.
[h] The Party also reported area data for buildings, recreational lands, transportation, water covered land and for carbon stock for buildings, recreational lands, and transportation, which are included in the respective totals.
[i] The classification of the land systems as defined in table II (annex I) was modified by the Party as shown in table 3b.
[j] Data are included under "agricultural lands".
[k] Land systems are divided into sub-categories, if available, data are provided separately when available. Soil carbon preliminary estimates are reported for all land classes (table 3b).
[l] Rangelands/grasslands were reported as not occurring. Wetlands/tundra is covered under other wooded lands ("other").
[m] 20 Tg of carbon in products and waste are reported but are not included in the totals.
[n] The data on area and carbon stock for forestry lands are given for 1988 that is the closest to 1990 year of the State Forest Inventory. In this case, NR indicates that data are not estimated.
[o] This total includes 630 000 ha of "forest conservation".
[p] This total consists of 26 000 ha of wetlands and 247 000 ha of tundra.
[q] Only soil carbon stocks 0 to 20 cm; biomass stocks are not included.

Table 3 (b): Summary of information on carbon stocks and area estimates for 1990 in Annex I Parties

Party	Data provided		Information provided			
	Land systems	Carbon stock	Carbon pool	Methods	Possible changes in carbon stocks	Uncertainties
Australia	Forestry land Agricultural land Rangelands/grasslands Wetland/tundra Other	Totals for each land system are provided	Biomass, litter, soil to 30 cm and organic carbon (charcoal)	Estimates were modelled using a calibrated model running in a geographic information system with area statements derived from national datasets. [MISC. 6, p. 29]	NR	NR
Austria	Forestry land Agricultural land Rangelands/grasslands Wetland/tundra Other	Data is split to carbon stocks in 1) Living biomass (above and below ground, annual means), and 2) in soil (50 cm depth)	Living biomass (above and below ground), soil carbon (50 cm depth)	Aboveground biomass (m^3 stemwood over bark, t dry matter of harvested agricultural biomass etc.) was converted to t C of total above- and belowground biomass by using expansion and conversion factors. The biomass figures for annual plants correspond to annual means. Measured concentrations of soil organic C were converted to C-pools by using soil specific conversion factors, where estimated amounts of coarse material (> 2 mm) and soil densities were taken into consideration. [MISC. 6, p. 131]	Forestry lands: Biomass C stock increased steadily in the period 1960 to 1996. In addition, the area of „Forestry lands" increased considerably from 1960 to 1996. Repetitions of the soil inventories were not undertaken so far. Therefore, the trends of the Austrian soil C-stocks are unknown.	Q_1A/Q_1A; (values are represented within the range of uncertainty in the submitted table)[a]
Canada	Forestry land Agricultural land (which includes rangelands/grasslands) Wetland/tundra Other	Totals for each land system are provided.	Forest: Above-ground and below ground biomass and total soil carbon Agricultural soil: soil depth to 1 meter	Estimates were derived from several sources and obtained using various methods. [MISC. 6, p. 83]	NR	Q_1A
Denmark[c]	Forestry land Agricultural land	A total for carbon stock in forestry land is provided	On average 25 t C/ha of total biomass (including clearcuts and "aggrading stands") + 125 t C/ha in SOM (including forest floors)	Forestry land: The estimates for the size of the carbon stocks in forest vegetation are based on conversion factors used to convert stemwood volume into whole-tree carbon stores for conifers and broadleaves (Danish Energy Agency 2000). [MISC. 6, p. 138]	Based on changes in areas due to afforestation of arable land and less based on changes in carbon content from changes in land-use.	Q_1A

Table 3 (b) *(continued)*

Party	Data provided		Information provided			
	Land systems	Carbon stock	Carbon pool	Methods	Possible changes in carbon stocks	Uncertainties
Finland	Forestry land Agricultural land, (Wetland/tundra included in Forestry land) Other Subcategories provided (see Table 3.c.)	Besides totals, for forestry land data is provided on C in trees, surface vegetation, forest soil, in peatland layers	Carbon pools (in trees, in surface vegetation, in forest soil and in peatland layers >30 cm thick) are covering all the forestry land area.	Preliminary estimates are based on a number of individual studies and research findings. The multi-source inventory method combines data from field measurements, air-borne data and other space-borne data as well as digital map data. [MISC. 6, p. 144]	In trees the carbon stock changes take place much faster than in soils. A number of studies show that the trend is in both cases ascending - increase of tree resources increases the carbon stock in biomass and, through growing forest littering in soils as well.	Q,A (Sampling error for the total volume of the growing stock for the whole country: ± 0.6%; error in the total tree biomass estimate: ± 10%)
France	Forestry land Agricultural land Rangelands/grasslands Wetland/tundra Other	Totals for each land system are provided	Above and below-ground biomass, soil carbon. Biomass in forest, woodlands, poplar plantations. [MISC.6, p. 154]	As in Table 2.b. [MISC. 6, p. 155]	NR	NR
Germany	Forestry land Agricultural land Rangelands/grasslands Other. New rows added: C in wood products, buildings, recreational lands, transportation, water covered.	Besides totals, data is provided on the carbon stocks in forests in an annex (see carbon pools column)	Forests: growing stock, woody biomass, leaves +needles, dead wood, forest floor vegetation, soil carbon (0-90 cm, including humus layer); Non forest systems: soil carbon in the top 0.3 m	IPCC 1996 and other methods; separately given for forest and non-forestry lands [MISC. 6, p. 168]	Only in agricultural lands and grasslands significant changes in carbon stocks are likely to be achievable by human interaction. The degree - hardly to estimate. As an upper limit we assume that by modifying agricultural practices a 10% positive change.	Q,A
Iceland	Forestry land Agricultural land Rangelands/grasslands Wetland/tundra Other	Totals for each land system are provided	Biomass and soil carbon	No information provided.	Forestry lands are expanding due to afforestation of approximately 1000 ha per year. Soil erosion is still ongoing and can be expected to increase the area classified as deserts.	Q,A

Table 3 (b) *(continued)*

Party	Data provided		Information provided			
	Land systems	Carbon stock	Carbon pool	Methods	Possible changes in carbon stocks	Uncertainties
Ireland	The land system notations are changed: Woodland, Tillage, Grassland, Peatland, Other	Besides totals, data is provided on soil carbon and vegetation carbon stock	Vegetation, soil carbon (15 cm depth)	References to the methods used can be found in MISC. 6, p. 179.	NR	NR
Italy	Forestry land Agricultural land Rangelands/grasslands	Totals for each land system are provided	Trees, soil, forest floor and understory vegetation	Carbon budget model, FOCSEM. According to this model, current carbon storage is estimated separately for several forest ecosystems: trees, soil, forest floor and understory vegetation. Estimates of carbon storage in trees are based on Corine Land Cover survey (forested area), on the Italian Institute of Statistics (ISTAT) figures (historical estimates of forested area, removals, fires). The carbon stored in agricultural lands and grasslands has been estimated according to the 1996 IPCC Revised Guidelines for the activity "CO_2 Emissions and Uptake from Land-Use Change and Management" [MISC. 6, p. 183]	NR	NR

Table 3 (b) *(continued)*

Party	Data provided		Information provided			
	Land systems	Carbon stock	Carbon pool	Methods	Possible changes in carbon stocks	Uncertainties
Japan	Forestry land Agricultural land (includes Rangelands/grasslands) Other Grassland included under agricultural land	Totals for each land system are provided	Forestry land: Above- and below ground biomass accounted as carbon stock. Litter, humus and soil carbon not included as carbon stock. Agricultural lands: soil carbon.	Forestry land: Carbon stock is estimated using stem volume in all forests, referring to the Survey of Current Status of Forest Resources, 1990, along with expansion coefficient, wood density and carbon content. Agricultural land: Carbon stocks in 1990 were estimated using the following data: - Total carbon stocks in cultivated soils from "Fundamental Survey of Environmental Quality for Soil (3rd, 1989-1993)" - Area of agricultural lands in 1990 Other: Carbon Stock = A × PW × BI × k, where A = area (ha); PW = percentage of planted tree area vis-a-vis park area; BI = biomass increase in a year; k = 0.5 carbon content [MISC 6/Add. 1, p. 20]	Forestry lands: As plantations established in postwar years are still in the growing stage, carbon stocks is increasing even if felling volume is subtracted out. Agricultural land: Even if total carbon stock in agricultural land decline as a result of decline in the total area of such lands increased to carbon emissions do not necessarily result. Other: depend on the definition of activities shown in Article 3.4 of the Kyoto Protocol	Q_1A

Table 3 (b) *(continued)*

Party	Data provided		Information provided			
	Land systems	Carbon stock	Carbon pool	Methods	Possible changes in carbon stocks	Uncertainties
Netherlands	Forestry land Agricultural land Rangelands/grasslands Wetland/tundra Other	Totals for each land system are provided	Forest: Biomass and forest soil carbon; Agricultural vegetation (standing crop, belowground biomass, litter and soil organic matter)	The estimates for the size of the carbon stocks in forest vegetation are based on widely applied conversions of forest inventory (stemwood volume) data to whole tree carbon. For the conversions international literature and IPCC reporting guidelines are used. For forest soil carbon, the distribution of Dutch forests over soil types was assessed. For each soil type profile descriptions are used to assess organic matter content. Those were converted to carbon. [MISC. 6, p. 195]	Possible changes in carbon stocks would be largely based on changes in areas and less on changes in carbon content, that accompany changes in land-use. Estimates would be highly uncertain and no extensive database exist yet. Estimates could be made available in the next 3 years on the basis of model calculations using soil maps.	Q,A (e.g. uncertainty for area: <5%; for carbon stock: 10-50%)
New Zealand	Forestry land (Planted areas, indigenous forest, shrublands, mangrove) Agricultural land (pastoral, horticultural) Rangelands/grasslands (Tussock) Wetland/tundra Other (Bare ground, urban areas, etc.)	Data on carbon stock only for planted areas, indigenous forest, and shrublands are provided. There is additional data on carbon stocks in litter and soil carbon in the explanatory text.	For planted forests: above and below ground carbon pools and litter (without soil carbon); indigenous forests and shrubs – above and below ground biomass (without litter and soil carbon). Values for litter and soil carbon for all class of land given separately [MISC. 6/Add.1, p. 34]	Sources and methods are fully described in New Zealand's National Inventory Report (2000), in Hall and Beets et al *Estimate of the carbon stored in New Zealand's indigenous forest and scrub vegetation for 1990*. Preliminary estimates from the Carbon Monitoring Project of soil carbon for all land classed (excluding urban area) are based on the Vegetative Cover Map areas and are provisional. Methods and data sources are described in Tate et al *Contribution of soil carbon to New Zealand's CO_2 emissions: revision of data layers and overlays*. [MISC. 6/Add.1, p. 34]	The carbon stock estimates presented in the table are based on preliminary results from this work. Changes in carbon stocks in planted forests are reported annual in New Zealand LUCF inventory. There is some evidence to suggest that there may be considerable changes in land-use occurring with the withdrawal of pastoral grazing on marginal agricultural land and to subsequent reversion to shrubland and ultimately indigenous forest.	Q,A (e.g. uncertainties for planted forests: ± 25%)

Table 3 (b) *(continued)*

Party	Data provided		Information provided			
	Land systems	Carbon stock	Carbon pool	Methods	Possible changes in carbon stocks	Uncertainties
Norway	Forestry land Agricultural land Wetland/tundra Other Wetlands/tundra covered under other wooded lands ("Other")	Besides totals, data is provided on carbon stocks in 1) above-ground woody biomass, 2) below ground woody biomass, and 3) soil carbon	Above-ground (stem woods, tops and branches), below ground (stumps and coarse roots) biomass, litter and woody debris and soil carbon	Forestry land: see Table 2.b Non-forestry land systems: Information on the methods used could be found in [MISC 6, p. 58]	Data on carbon stocks in 1995, 2000 are provided	Q.A/ Q.A is g for soil carbon uncertainty was estimated to 17-22%)
Russian Federation	Forestry land Agricultural land Grassland/pastures	Carbon stocks provided for forestry land only	Not specified	No information provided	NR	NR
Spain	Forestry land	A total for forestry land is provided	Forests: total live biomass	The formula for calculation of the increase in forestry biomass uses the terms indicated below: the growth in larger trees, where the factor of 1.6 allows VCC" to be expanded into the volume of total live biomass. The formula has ignored the potential contribution of undergrowth and sparse trees in cleared forestry areas, as being, in the first case, contributions difficult to estimate precisely and, in the second case, of a low amount, perhaps less than 2%. In addition, the contribution of trees on non-forestry land (urban trees, etc.) is ignored. [MISC. 6, p. 211]	NR	NR

Table 3 (b) *(continued)*

Party	Data provided		Information provided			
	Land systems	**Carbon stock**	**Carbon pool**	**Methods**	**Possible changes in carbon stocks**	**Uncertainties**
Sweden	Forestry land Agricultural land Rangelands/grasslands Wetland/Peatlands Other (mountains, nature reserves, urban areas, infrast., etc.) Forest conservation added (productive forest area under conservation 1990)	Totals for each land system are provided	Forestry land: Above and below ground forest biomass and soil organic carbon estimated to 1 m Agricultural land and pastures: carbon content in agricultural / pasture soils including biomass Wetland/peatlands: average peatdepths to 2 m	NR	NR	NR
Switzerland	Forestry land Agricultural land Rangelands/grasslands Wetland/tundra Other stock of wood products (housing, paper ...)	Besides the totals, data for forestry lands is split to soil carbon and carbon stock in biomass	Forestry land: biomass; Cropland and rangeland/grassland: only soil carbon stocks 0-20 cm, biomass stocks are not include	Some references and key assumptions provided. [MISC. 6/Add.1, p. 75]	The average change over the years 1990 to 1995 in biomass is +1300 t C per year; this increase may continue the next one or two decades.	NR
United Kingdom	The land system notations are changed to Woodlands, Arable, Pasture, Semi-natural, Other.	Besides the totals, data on vegetation carbon stock and soil carbon is provided.	Above and below ground biomass for all plant types, woody and non-woody. Soil carbon to a depth of 1 m (or less where appropriate) for mineral soils and to bedrock for peat soils.	Reference is made to an additional document [MISC. 6, p. 223]	Carbon stocks in forests are increasing due to programmes of A. Stocks of soil carbon, may be decreasing due to past expansion of agricultural use but this trend is slowing due to a range of agri-environment policies which have expanded conservation areas and tended to extensity agricultural practices.	Q_tA (uncertainty = ± 25%)

Table 3 (b) *(continued)*

Party	Data provided		Information provided			
	Land systems	**Carbon stock**	**Carbon pool**	**Methods**	**Possible changes in carbon stocks**	**Uncertainties**
United States	The land system notations are changed: Forest (managed only); crop lands, grazing lands; wetland; [w] other (urban, water, etc).	Totals for each land system are provided.	Managed forests: as in Table 2.b, without carbon in wood products. Croplands and grazing lands: carbon stocks in the top 30 cm of soil.	Forests: as in Table 2.b; Cropland and grazing land: IPCC methodology. Details could be found in MISC. 6/add. 1, p. 120.	Possible future trends in carbon stocks are discussed in details. [MISC. 6/add. 1, p. 121]	Q_1A/ Q_1A (Forests: 80% confidence interval. Cropland and grazing land: Q_1A)

[q] The uncertainty of the total carbon stock in living biomass (334 ± 42 Mt C) was calculated by assuming a relative uncertainty of 20 % for the land categories "Agricultural lands" and "Grasslands" and of 70 % for the category "Other". The uncertainty of the total carbon stock in soil (792 ± 209 Mt C) was calculated by assuming a relative uncertainty of 70 % for the land category "Other".

[r] Data are reported only for forest and agricultural land.

[s] Under "Other", Norway also reports "Carbon in products and waste".

[t] Only forestry land is included in the estimates

[u] VCC: Taken directly from Table 201 «Existencias por especie y Comunidad Autónoma» in the publication entlited «Segundo Inventario Forestal Nacional - Vol. España».

[v] Other includes : stock of wood products, housing, paper…

[w] Grazing lands and wetlands are subdivided to privately and federally owned.

Table 3 (c): Definition of land systems provided by Annex I Parties

Part 1: Forestry land

Party	Forestry Land
Austria	"Forestry land" according to the Austrian Forestry Act is an area stocked by trees (a list of tree species in this context is g iven in an annex to the Austrian Forestry Act), if the stocking of trees represents an area of at least 1000 m ^{2} and is of an average width of at least 10 m. Forest areas, which are unstocked due to forest management practices (for instance harvesting areas or areas used for timber storage, skidding tracks o r forest roads), are still referred to as "forestry land" according to the Austrian Forestry Act.
Canada	See definition of a forest in Table 2.c.
Denmark	1) Areas supporting a stand that now or later may produce wood or other forest products. 2) Fields planted to Christmas trees and greenery (max. 10% of the area of each forest district). 3) Orchards, parkland, willow scrub, windbreaks etc. are not included in the forest area.
Finland	According to the Finnish system, forestry land is grouped into three classes according to site productivity: (i) Forestry land, where the potential annual increment is at least 1 m ^{3}/ha/a; (ii) Scrub land (unproductive forestry land), where the potential annual increment is between 0.1 - 1.0 m ^{3}/ha/a; Waste land, unless naturally treeless, products less then 0.1 m ^{3}/ha/a, and (iv) other forestry lands, mainly roads, depots, etc. The international definition of forestry land, as applied in the UN/ECE-FAO Temperate and Boreal Forest Resource Assessment 200 0, sets a 10% canopy cover as the threshold between forestry land and other lands.
France	Forestry lands: forests and other woodlands, in accordance with FAO definitions, including forests, woodlands, poplar plantatio ns, scattered trees, hedges and heathland.
Iceland	Forestry lands are native birch woodland and planted forest using native species and introduced conifers and broadleaf trees.
Ireland"	Woodland cover was estimated as the sum of the Broad-leaved forest, Coniferous forest, Mixed forest and Transitional woodland/s crub categories.
Japan	"Land with trees and/or bamboo growing in a group, and/or land provided for collective vegetation of trees and/or bamboo (Artic le 2.1, the Japanese Forest Law).
Netherlands	Crown cover 20%, minimum area 0.5 ha, minimum average width 30 m.
New Zealand	Planted forests, indigenous forest, shrublands, mangrove .
Norway	See definition of a forest in table 2.c.
United States"	Managed forest (timberland) only. Other forestry lands (such as parks, wilderness, wildlife preserves, and recreation areas) ar e not included.

Part 2: Agricultural land

Party	Agricultural land
Austria	„Agricultural lands" include lands which are used for crop and cereal production and gardenland (e.g. vineyards, orchards etc.).
France	Cultivated land, fallow land, orchards and vineyards, family gardens.
Germany	There are two terms commonly used in German agro-statistics to describe agricultural lands "Landwirtschaftlich genutzte Fläche" LN and "Landwirtschaftsfläche" LF. While LF describes the total area devoted to agriculture, LN describes only that part of LN which is actually used and set aside land, private parks, lawns and *decorational* gardens are excluded. LN is reported here and covers all area used for agriculture, horticulture and viticulture. In German agro-statistics the subclasses grassland and grassland to graze animals are usually report within LN. We excluded it here, as it seems reasonable to report it in under the next category.
Iceland	Agricultural land are permanent hay fields, potato fields and barley fields.
Ireland*	The area of tillage was estimated as the sum of the Non-irrigated arable land and half of the Complex cultivation patterns categories.
Japan	Corresponding divisions: paddy fields, normal patches, fruit farms, grasslands, and facilities.
Netherlands	The area of agricultural lands include permanent crops, arable land, vegetables, greenhouses and flower cultivation..
New Zealand	Pastoral, horticultural *(sub-divisions provided in Table II).*
Norway	The area of grain crops corresponds quite closely with the annually cultivated land. Areas of other annually cultivated crops are very small. The remainder 2/3 is mainly grass lay of varying age, e.g. from 4 to 7 years. Cultivated areas in different counties are provided from agricultural statistics.
United States*	Cropland includes all land on which agricultural field crops are grown. This includes annual crop production, perennial crop production such as hay, and land that is still considered agricultural land but is not currently being used for crop production (e.g. set-aside and Conservation Reserve Program). All cropland is considered as managed for purposes of food and fibre production, using a variety of practices including crop selection and rotation, tillage, manuring, fertilisation, irrigation, harvest and residue management.

* Land systems classification are modified as shown in table 3b.

Part 3: Rangelands/grasslands

Party	Rangelands/grasslands
Austria	„Grasslands" includes agricultural used grasslands, agricultural used alpine pastures and no more used agricultural grasslands, which have not been converted to other uses
France	Agricultural land under herbaceous cover.
Germany	This term is not to be found in German agrostatistics, however the subclasses grassland and grassland to graze animals fit into this category.
Iceland	Rangelands/grasslands are non-cultivated land used for grazing.
Ireland	The area of grassland was estimated to be the sum of Pastures, Land principally occupied by agriculture with significant areas of natural vegetation, Natural grassland and half of the Complex cultivation patterns and Natural grassland categories.
Netherlands	Including grasslands in low areas.
New Zealand	Tussock
United States*	Grazing land (privately owned and federally owned) is defined by the Society for Range Management as: "a collective term that includes all lands having plants harvested by grazing without reference to land tenure or other land-uses, management, or treatment practices." Grazing land includes all land on which the primary productive use is for herbivore grazing, including permanent (or long-term) pasture and rangeland. Our definition for grazing land does not include forested land that is grazed or land used primarily for annual crops or hay production that may be seasonally grazed.

Part 4: Wetlands/tundra

Party	Wetlands/tundra
Canada	Wetlands in Canada are defined as lands saturated with water long enough to allow the physical processes or biological activities characteristic of aquatic environments. They are divided into peatlands (bogs and fens) and non-peat accumulating wetlands (marsh, swamps and shallow water).
France	Water and wetlands.
Iceland	Wetland are bogs and mires (no permafrost or tundra areas are found in Iceland).
Ireland*	The area of peatland was estimated as the sum of Peat bogs, the Moors and heathland, and half of the Natural grassland.
Netherlands	The area of wetlands (Wetland International, 1998) includes designated areas in the Netherlands but does not include coastal zones (i.e. Waddensea).
Norway	*See "other" definitions below*
United States	Areas for "Wetland" (privately owned and federally owned) derive from the category for organic soil, non-cropland in the IPCC inventory. Wetland areas include private lands that have histosols (i.e., organic) soils only. They do not include other wetland soils or tundra.

Part 5: Other

Party	Other
Austria	„Other" includes alpine unused areas with undisturbed vegetation which do not belong to the category „Forestry lands", sealed land for buildings, land for traffic infrastructure, glaciers and rocks, surface waters etc
Finland	Includes: build-up land, unclassified, other spatially not specified: wood products (inlcudes wooden products of Finnish building stock) and wood products in landfills.
France	Bare rock areas, "artificialized" land, urbanised land, and "off limit" areas.
Germany	Buildings and surroundings: This term describes areas covered by buildings as well as the surrounding free areas which have a functional association to the use of the buildings, such as playgrounds home gardens, yards and others. Recreational land: All types of sport grounds, or areas devoted to present animals (zoological gardens) or plants (botany gardens). Transportation and traffic area: Areas devoted for transportations by road-, rail-. Air- or water traffics. Water covered: Inland areas covered permanently or non permanently by water, regardless of natural or manmade origin, including river banks towing paths and similar. Other: All uses not attributable to above mentioned categories
Iceland	Deserts are areas with limited plant cover either due to erosion or sand encroachment (mainly on the central highlands).
Ireland	Other comprises Green urban areas and Sport and leisure areas.
Japan	Square parks, Neighbourhood parks, Community parks, Comprehensive parks, Sport parks, Large scale parks, Specific parks, National government parks, Buffer greenbelts, Ornamental green spaces, Greenways, Specified community parks, and Green space conservation zones
Netherlands	The area of other land includes urban land, lakes, rivers and infrastructure, nature areas, and for other land-use (CBS, 1998).
New Zealand	Include bare grounds, urban areas, etc.
Norway	"Other wooded lands" defines areas with a minimum of 5 % crown coverage and tree heights over 5 meters at maturity, or a crown coverage of more than 10% and tree heights under 5 meters at maturity, which is the FAO definition.
Sweden	Mountains, nature reserves, urban areas, infrastructure, etc.
Switzerland	Stock of wood products (housing, paper ...)
United States	Chiefly urban/peri-urban, other rural land, and some montane tundra

DATA AND SUMMARY INFORMATION RELATED TO TABLE III OF THE DATA FORMAT (ARTICLE 3.4. OF THE KYOTO PROTOCOL)

Table 4 (a): *Preliminary data and information provided by Annex I Party on Article 3.4 activities, related GHG emissions and removals, involved areas, and projected carbon stocks changes* (additional activities under Article 3.4)

The structure of this table diverts slightly from the information requested in the original mandate (see annex) with respect to the non-CO_2 gases. The data for N_2O and CH_4, are displayed in a common column under "non-CO_2" as only few Parties have treated these gases.

Most of the Parties have indicated that they have reported for activities according to the periods "since 1990 up to 1995", "since 1990 up to 1999" and "since 1990 up to 2012". However, other Parties have indicated different periods. Any deviation from the standard reporting periods indicated in the data format are indicated in a note at the end of the table.

Table 4 (b): *Summary of information on GHG emissions and removals, involved areas, and projected carbon stock changes relevant to Article 3.4 activities in Annex I Parties*

This table contains an excerpt of the explanatory text submitted by each Party related to additional activities under Article 3.4, the accounting approaches used, the carbon pools, the methods used to provide estimates, and the projections for the first commitment period.

Table 4 (c): *Definitions of activities proposed under Article 3.4*

This table compiles the definitions provided by each Parties of additional activities under Article 3.4. As for tables 3 (c) and 4 (c), only a selection of the explanatory text submitted by Parties is displayed in the table.

Table 4 (a): Preliminary data and information provided by Annex I Party on Article 3.4, related GHG emissions and removals, involved areas, and projected carbon stocks changes (additional activities under Article 3.4)

Party	Activity	Accounting framework		a_{I} (1000 ha)	$CO_{2,\ I}$ (Gg CO_2)*	non-$CO_{2,\ I}$ (Gg CO_2 equiv.)*[f]	a_{II} (1000 ha)	$CO_{2,\ II}$ (Gg CO_2)*	non-$CO_{2,\ II}$ (Gg CO_2 equiv.)*[f]	a_{cp} (1000 ha)	$\Delta C_{,p}$ (Gg C)	$CO_{2,\ cp}$ (Gg CO_2)*	non-$CO_{2,\ CP}$ (Gg CO_2 equiv.)*[f]
Australia	1. Revegetation activities	LB		NR	NR	NR	NR	NR	NR	1 048	10 906	39 989	NR
Canada[a]	1. Forest management	LB		134 000	477 000	-8 000 (CH_4) -6 000 (N_2O)	134 000	730 000	-11 000 (CH_4) -10 000 (N_2O)	134 000	48 000	176 000	-4 000(CH_4) -5 000(N_2O)
	2. Cropland management	LB	a) low[b]	34 666	-22 091	NR	34 385	-22 161	NR	34 150	3 078	11 285	0
			b) medium	34 666	-22 091	NR	34 385	-22 161	NR	33 400	13 089	47 992	-87.03(CH_4) -7 008(N_2O)
			c) high	34 666	-22 091	NR	34 385	-22 161	NR	33 300	20 478	75 087	-87.13(CH_4) -8 500(N_2O)
	3. Grazing land management and livestock	LB	a) low	26 174	3 587	NR	26 798	8 682	NR	26 487	2 073	7 603	0
			b) medium	26 174	3 587	NR	26 798	8682	NR	27 300	7 051	25 853	-3 307(CH_4) -2 422(N_2O)
	4. Shelterbelt	LB	a) low	20	300	NR	30	600	NR	70	400	1 400	0
			b) high	20	300	NR	30	600	NR	120	600	2 200	0
Finland[c]	1. Forest management (including forest conservation)	LB		23 000	154 900	NR	23 000	198 200	NR	23 000	11 000[d]	40 000[d]	NR

Table 4 (a) *(continued)*

Party	Activity	Accounting framework	a_I (1000 ha)	$CO_{2,I}$ (Gg CO_2)[a]	non-$CO_{2,I}$ (Gg CO_2 equiv.)[a][d]	a_{II} (1000 ha)	$CO_{2,II}$ (Gg CO_2)[a]	non-$CO_{2,II}$ (Gg CO_2 equiv.)[a][d]	a_{cp} (1000 ha)	ΔC_{cp} (Gg C)	$CO_{2,cp}$ (Gg CO_2)[a]	non-$CO_{2,CP}$ (Gg CO_2 equiv.)[a][d]
France	R. Reference	LB	13 948	167 422	NR	13 948	279 036	NR	13 948	38 016[b]	139 518	NR
	1. Forest management in state forests	LB	1 610	3 901	NR	1 610	6 502	NR	1 610	886[b]	3 251	NR
	2. Forest management in other public forests	LB	1 984	18 352	NR	1 984	30 586	NR	1 984	4 167[b]	15 293	NR
	3. Forest management in private forests	LB	2 497	34 793	NR	2 497	57 989	NR	2 497	7 900[b]	28 995	NR
	4. Conversion of mixed coppice/high forest stands into high forests	AB	110	513	NR	184	855	NR	423	536[b]	1 966	NR
	5. Enhancement of carbon sink in wood products	scenario A: economic growth = +1%				NR	NR	NR	NR	NR	NR	13 000
		scenario A: economic growth = +3%				NR	NR	NR	NR	NR	NR	32 000
Germany[c]	1. Forest management	LB	10 740	168 597	NR	10 740	335 748	NR	10 740	43 000	155 000	NR
Iceland	1. Revegetation	LB	12.5	172	NR	28.2	699	NR	70	262[b]	963	NR
Italy	1. Activities to prevent carbon emissions (fire prevention)	AB	11	2 238	32 (CH_4) 3.3 (N_2O)	81	4 201	127.7 (CH_4) 13 (N_2O)	NR	NR	NR	NR
	2. Conversion of grazing lands to forest	AB	437	4 955	NR	631	8 125	NR	1 308	5 537[b]	20 321	NR
Japan[e]	1. Forest management											
	1.a. all forests	AB	25 146	457 512	NR	25 197	740 564	NR	25 220	56 840	208 415	NR
	1.b. managed forests	AB	8 084	135 792	NR	8 657	233 156	NR	12 450	48 948	179 475	NR
	2. Urban greening	AB	15 050[f]	166	NR	38 050[f]	698	NR	83 050[f]	378	1 386	NR

Table 4 (a) *(continued)*

Party	Activity	Accounting framework	a_i (1000 ha)	$CO_{2,i}$ (Gg CO_2)*	non-$CO_{2,i}$ (Gg CO_2 equiv.)*[d]	a_{ii} (1000 ha)	$CO_{2,ii}$ (Gg CO_2)*	non-$CO_{2,ii}$ (Gg CO_2 equiv.)*[d]	a_{cp} (1000 ha)	ΔC_{cp} (Gg C)	$CO_{2,cp}$ (Gg CO_2)*	non-$CO_{2,CP}$ (Gg CO_2 equiv.)*[d]
Netherlands[g]	1. Forestry improved management	LB/AB	5.4	59	NR	6.34	70	NR	10.24	154	563	NR
	2. Cropland	LB/AB	55	60	NR	91	100	NR	209	63	230	NR
	3. Grazing land	LB/AB	2 700	-16 200	NR	4,500	-27 000	NR	10 350	-3 682	-13 500	NR
Norway	1. Fertilisation	AB	2	51	0.56 (N_2O)	2	84	0.93 (N_2O)	35	725	683	1.54 (N_2O)
Spain	Activity 1	LB	13 905	949	NR	13 905	1 855	NR	NR	NR	NR	NR
Sweden	1. Forest management	LB	23 000	198 000	NR	23 000	297 000	NR	23 000	22 500	82 500	NR
	2. Forest conservation	LB	200	440	NR	260	570	NR	510	300	1 000	NR
Switzerland	1. Establishment of carbon forests and forest reserves to increase carbon stock	LB	12	790	NR	12	1 185	NR	100	1 450	5 316	NR
		AB	12	NR	NR	12	NR	NR	100	NR	NR	NR
	2. Cropland management	LB	1	3	NR	4	14	NR	19	29	105	NR
	3. Cropland conversion to grassland	LB	3	11	NR	8.63	34	NR	11	26	95	NR
	4. Grassland management	LB	56	NR	NR	80.34	NR	NR	100	NR	NR	NR
	5. Increased use of wood products and other long term wood materials	AB	NR	NR	NR	NR	369	NR	NR	220	806	NR
United Kingdom	1. Forest management	LB	1 400	57 000	NR	1 400	100 000	NR	1 400	12 250	45 000	NR[g]
	2. Bioenergy crops	LB	0.084	15	0	0.423	80	0	125	1 250	4 600	NR[g]
United States	1. Forest management	LB	192 100	2 593 000	IE[i]	198 930	8 770 000	NR	196 150	1 442 000	5 292 140[h]	NR
	2. Cropland management	LB	167 770	28 000	-18 000(CH_4) -410 000(N_2O)	168280	305 000	-68 000(CH_4) -1 500 000(N_2O)	168 280	78 000	286 260[h]	NR
	3. Grazing land management	LB	274 410	72 000	-140 000(N_2O)[i]	276140	184 000	-270 000(N_2O)	276 140	41 000	150 470[h]	NR

[a] Non-CO_2 emissions associated with agricultural land management are already included in the GHG accounting for the Kyoto Protocol. This table shows only those additional emissions and removals that would be added into the accounting for the Protocol if cropland management and grazing land management & livestock are included under Article 3.4. In this case, NR for non-CO_2 gases indicates that data are not estimated.

[b] The low, medium and high range of these estimates reflects different adoption rates of sink-enhancing practices.

[c] Change in forest area is not considered in this assessment, but changes in carbon stocks are included in gross figures. Non-CO_2 gases are not included in the assessment, however, the Party reports that some estimates are available and provides reference to a publication.

[d] Different estimates vary between 4000-13 500 Gg C and 15-50 Mt CO_2 during 2008-2012.

[e] In this case, NR for non-CO_2 gases indicates that data are not estimated.

[f] For urban greening, the data shown are number of planted trees per year (x 1000)

[g] NR in this case indicates that the data are not available.

[h] These numbers were calculated by the secretariat, from ΔC_{cp} or CO_{2_cp} data provided by Parties, by using 3.67 as a conversion factor.

[i] Estimates of all N_2O emissions from soil from which nitrogen fertilizer is applied are included under "cropland management".

[j] Estimates for CH_4 are not included because the removal of this gas by soils is not proposed by this Party under Article 3.4.

Note: Some Parties have reported against different periods compared to the one indicated in the data format as follows: USA: a_I: 1992, a_{II} : 1997, CO_{2I} : 1990-1991, CO_{2II} : 1990-1996. Germany: a_I and CO_{2I}:1994. Switzerland: for activities 2 and 3:a_{II} : 1998. Sweden: a_{II}: 1998, CO_{2II} : 1990-1998. Most of the Parties do not indicate whether they include or exclude the last year of the standard period of the data format in their calculations. Japan, Netherlands, and Norway indicate that the last year is included.

• These columns would contain the sum over the years concerned of net annual emissions by sources and removals by sinks for the Article 3.4 activities proposed.

A negative sign indicates either emissions by sources or a decrease in carbon stocks. A positive sign indicates either removals by sinks or an increase in carbon stocks.

To convert a carbon amount to CO_2 multiply it by 3.67.

[k] CH_4 and N_2O emissions are converted to CO_2 equivalent emissions by using the global warming potential (GWP) values of 21 for CH_4 and 310 for N_2O (Source: Second Assessment Report of the IPCC, 1995)

a_i	Area (1000 ha) in 1995 or possibly an earlier specific year involved in the Article 3.4 activity since 1990.
$CO_{2,i}$	Net CO_2 emissions (Gg CO_2) by sources and removals by sinks related to the Article 3.4 activity, accumulated from 1990 to the same year as used in a_i.
$CH_{4,i}$	CH_4 emissions (Gg CO_2 equivalent) by sources related to the Article 3.4 activity, accumulated from 1990 to the same year as used in a_i
$N_2O_{,i}$	N_2O emissions (t CO_2 equivalent) by sources related to the Article 3.4 activity, accumulated from 1990 to the same year as used in a_i.

a_{II} Area (1000 ha) in 1999 or possibly an earlier specific year involved in the Article 3.4 activity since 1990.
$CO_{2,II}$ Net CO_2 emissions (Gg CO_2) by sources and removals by sinks related to the Article 3.4 activity, accumulated from 1990 to the same year as used in a_{II}.
$CH_{4,II}$ CH_4 emissions (Gg CO_2 equivalent) by sources related to the Article 3.4 activity, accumulated from 1990 to the same year as used in a_{II}.
$N_2O_{,II}$ N_2O emissions (Gg CO_2 equivalent) by sources related to the Article 3.4 activity, accumulated from 1990 to the same year as used in a_{II}.
a_{cp} Projected area (1000 ha) in 2012 involved in the Article 3.4 activity since 1990.
ΔC_{cp} Projected carbon stock changes (Gg C) over the first commitment period related to the Article 3.4 activity since 1990.
$CO_{2,cp}$ Projected net CO_2 emissions related contribution (Gg CO_2) of the Article 3.4 activity to the first commitment period assigned amount of the Party.
$CH_{4,cp}$ Projected CH_4 emissions related contribution (Gg CO_2 equivalent) of the Article 3.4 activity to the first commitment period assigned amount of the Party.
$N_2O_{,cp}$ Projected N_2O emissions related contribution (Gg CO_2 equivalent) of the Article 3.4 activity to the first commitment period assigned amount of the Party.

Table 4 (b): Summary of information on GHG emissions and removals, involved areas, and projected carbon stock changes relevant to Article 3.4 in Annex I Parties (additional activities under Article 3.4)

Party	Activities	Information provided on				
		Accounting approaches		Carbon pools	Methods	Projections
		AB/LB	Additional explanations			
Australia	Revegetation	LB	The data presented in Table III assumes a LB accounting framework, in which an area of land would be drawn into the Article 3.4 accounting system when an identified revegetation activity has occurred post 1990. [MISC. 6, p.30]	Above ground biomass.	A rate of carbon sequestration of 2.3 tonnes of carbon per hectare per year was used for revegetation areas, based on analysis by the Bureau of Resource Sciences. This is the average rate of carbon sequestration rate for the current mix of revegetation activities in Australia, including wide spaces trees, trees in windbreaks and shelterbelts, trees in alley plantings, salt bush, tea tree and oil mallee. [MISC. 6, p.30]	Data and key assumptions are provided. Mathematical programming model of Australia's broadacre agricultural sector based on farm level data collected in ABARE's Australian agricultural and grazing industries survey.

Table 4 (b) *(continued)*

Party	Activities	Information provided on				
		Accounting approaches		Carbon pools	Methods	Projections
		AB/LB	Additional explanations			
Canada[b]	Forest management	LB	We have used a variety of assumptions and currently available data to derive the estimates shown in Table III, but we emphasize that these approaches do not reflect the systems that Canada proposes to use to measure and monitor additional activities. These proposed systems currently are being assessed and will be implemented as required once decisions have been made on what is acceptable. Our proposal for the inclusion of forest management would be accounted for using a LB accounting approach in terms of the managed forest area. [MISC. 6, p. 84]	All biomass pools (above and below ground living biomass, harvested materials and harvested slash). Soil carbon not included (although proposal for inclusion of all pools that are sources).	Our estimates are based on the methodology of the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* and the data underlying Canada's latest report on LUCF, published in 1999 as part of our greenhouse gas inventory (Sellers and Wellisch 1998, Neitzert et al. 1999) [MISC. 6, p. 85]	Data and key assumptions are provided for each activity.
	Cropland management		Details on the approaches are given in MISC. 6, p. 86, 93 (see annex 3 to Canada's submission).	Soil organic carbon pool.	CEEMA, CRAM, CENTURY model. [MISC. 6, p. 86, 93]	
	Grazing land management					
	Shelterbelt management			Above and below ground biomass carbon.	Based on information on land productivity, tree species and growth rates. [MISC. 6, p. 86, 93]	

Table 4 (b) *(continued)*

Party	Activities	Information provided on				
		Accounting approaches		Carbon pools	Methods	Projections
		AB/ LB	Additional explanations			
Finland	Forest management (including forest conservation)	LB	Forest inventories and information systems provide data on stemwood increment, harvesting and drain. For assessing the carbon balance, annual carbon sequestration estimates of woody biomass are based on increment figures of the Finnish nationa; Forest Inventory. Annual carbon release estimates are derived from harvesting statistics, estimated cutting waste and natural mortality. [MISC. 6, p. 147]	In this preliminary assessment above ground woody biomass, and below ground woody carbon are included.	The Finnish National Forest Inventory is based on inventories on systematical sampling areas. The specific technical inventory illustration can be found e.g. on the website of Finnish Forest Research Institute, http://www.metla.fi/tutkimus/vmi/nfi.htm [MISC. 6, p. 148]	Data and key assumptions are provided. Future projections are based on the Finnish National Forestry Programme (approved by the Government of Finland in 1999), that aims at increasing use of wood for renewable source of energy by 2010.
France	Forest management in: - state forests	LB	No explanations are provided	Above and below ground biomass, harvested materials	See table 2 .b. and MISC. 6, p.155.	Data and key assumption are provided.
	- other public forests					
	- private forests					
	Conversion of mixed coppice/high forest stands into high forests	AB				
	Enhancement of carbon sink in wood products	NR				

Table 4 (b) *(continued)*

Party	Activities	Information provided on				
		Accounting approaches		Carbon pools	Methods	Projections
		AB/LB	Additional explanations			
Germany	Forest management	LB	No explanations are provided	Above ground biomass. Litter, below-ground biomass and soil carbon have been considered to remain constant over time under sustainable management and have not been included	Carbon sequestration has been estimated by comparing biomass increment and harvest, using the methodology for greenhouse gas inventories (IPCC guidelines for GHG Inventories) [MISC. 6, p. 172]	Data available Key assumption provided
Iceland	Revegetation	LB	Methods to measure the sequestration (in trees and by afforestation, sequestration in biomass other than trees, and sequestration in soils). The research program (initiated in 1998), aims to formulate an Icelandic Sequestration Method (Ice-C-Method) which will be, after completion, used for determining carbon sequestration. At this stage it is mostly designed for revegetation activities, but other similar methods are being developed for the forestry activities. [MISC. 6/Add.1, p. 7]	Soil carbon, above-ground biomass, litter and rootmat. Life roots below the rootmat are excluded as research shows that this fraction normally yields <1% of the total carbon.	All data is verifiable with aerial information stored in a GIS system, together with information on site conditions and revegetation treatment. Each area receives its carbon sequestration rate, based on research (Ice-C-Method), and samples are taken from each site for carbon measurement. The carbon sequestration for each of the sites is then adjusted according to results from measurements. [MISC. 6/Add.1, p. 8]	Data is provided only for CO_2

Table 4 (b) *(continued)*

Party	Activities	Information provided on				
		Accounting approaches		Carbon pools	Methods	Projections
		AB/ LB	Additional explanations			
Italy	Activities to preserve carbon emissions (fire prevention)	AB	No explanations provided	Not specified	No explanations provided	No data and information.
	Conversion of grazing land to forests					Only data are provided.
	Soil carbon conservation	NR				
	Forest conservation	NR				
Japan	Forest management	AB	The AB accounting approach is applied for estimation. Sequestration is estimated based on growth of the Managed Forest in the assessment period and, as with carbon stocks from the activities under Article 3.3, above- and below-ground biomass is estimated with standing tree volume, and then sequestration under Article 3.3 and emissions due to harvest are subtracted. [MISC. 6/Add.1, p.24]	Carbon pools of above- and below-ground biomass other than understory vegetation, litter, humus and soil carbon.	No models or key parameters are used. [MISC. 6/Add.1, p.24]	Data and references provided.
	Urban Greening		Accounted by the number of planted trees for this estimation. Therefore, it is also applicable in the case of other divisions of land. Use the annual average number of planted trees and the trends from 1991 to 1995. Estimate carbon stocks by multiplying this projected activity data: biomass increase in the wooded land under the IPCC definition (2.0 t/ha); carbon content coefficient (0.5); surveyed number of planted tree in the urban park (1,000 pieces/ha). Since these activities develop areas of land, to plant trees artificially where there has been previously no greenery, no baseline is used. This is because it can be regarded as the same activities as "afforestation" under Article.3.3. [MISC. 6/Add.1, p.24]	Above- and below-ground biomass other than understory vegetation, litter, humus and soil carbon are included in carbon pools.	Surveys of current status of urban parks which form green zones in urban planning. [MISC. 6/Add.1, p.24]	Data available Key assumptions provided.

Table 4 (b) *(continued)*

Party	Activities	Information provided on					
		Accounting approaches		Carbon pools	Methods	Projections	
		AB/ LB	Additional explanations				
Netherlands	Forest management	AB, LB'	For details on forest management approach see Table 2.b and MISC.6, p. 198	Whole tree biomass, litter, soil organic matter, slash and wood products	The average carbon pools in the forest biomass and average regrowth rates are used. No further stratification has been applied apart from regrowth rates for forests on agricultural lands and regrowth rates for the existing forest that is being harvested. For the subsequent periods simple assumptions were made for the regrowth rates times area per age class. We did not distinguish between forest growth rates (and soil carbon losses) on former cropland or pasture, or different soil types. [MISC. 6, p. 198]	Data and key assumptions are provided.
	Cropland management		For details on cropland management see MISC. 6, p.199	Below ground C in litter and soil.	Methodologies and data are scarce; calculations for the C stocks soil could be made based on model calculations and soil types. With these model exercises, N_2O emissions for agriculture in the Netherlands have been estimated (ROB-Agro-Report, in prep). The accounting approaches are based on statistical data from annual inventories on agricultural practices and farm management that are available from LEI-DLO and CBS as sources of statistical data; these are considered to be equal to FAO inventories. [MISC. 6, p.199]	
	Crazing land management		For details on grazing land management see MISC.6, p.200				

Table 4 (b) *(continued)*

Party	Activities	Information provided on				
		Accounting approaches		Carbon pools	Methods	Projections
		AB/ LB	Additional explanations			
Norway	Increased fertilisation in older forests	AB	The assessed activity can be interpreted to be narrow-based, and we have calculated the outcome in increased carbon uptake from estimations of area of practice and increased increment following the fertilisation. Our assessment also includes estimates of emissions of nitrous oxide resulting from the activity. [MISC. 6/Add. 1, p. 65]	Above-ground (stem woods, tops and branches), below ground (stumps and coarse roots) biomass and soil carbon. Carbon stocks in harvested materials are not included	For details on methods see MISC. 6/Add. 1, p. 66.	Data and key assumption provided. Trends beyond the first commitment period are also given.
Spain	Activity 1	LB	[MISC. 6, p. 213]	Biomass	There are not global scale measurements of C, but local experimentation areas. Method of calculation is based in VCC data provided by the difference between the Second National Forest Inventory (IFN-2) and the First National Inventory (INF-1). [MISC. 6, p. 213]	No data and information are provided.

Table 4 (b) *(continued)*

Party	Activities	Information provided on				
		Accounting approaches		Carbon pools	Methods	Projections
		AB/ LB	Additional explanations			
Sweden	Forest management	LB	Considered as a broad activity. The managed forest area is averaged to be constant over the years 1990 – 2012. Productive forestry land differs from other landtypes, marginal lands, etc which also may contain slow growing forests or tree cover, by storing certain amount of carbon every year provided that the biomass increment is bigger than removals by harvesting or any other circumstance like fires, storms, etc. [MISC. 6, p. 217]	Above and below ground forest biomass	No information is provided.	Only data are provided.
	Forest conservation	LB	Considered as a narrow activity. Forests included in Table III are all well growing exceeding average annual increment of Swedish forests as no forest measures like thinning or any kind of cutting occur. [MISC. 6, p. 217]			
Switzerland	Establishment of carbon forests and forest re-serves to increase carbon stock	LB/ AB	No additional information is reported.	Not specified.	Estimation of possible area in CP multiplied by average growth of Swiss forests. MISC.6/Add 1, p.77	Data and key assumptions are provided.
	Cropland management	LB	Activities belong to the broad categories cropland/grassland management and cropland conversion [MISC. 6/Add. 1, p. 77]	Soil organic carbon 0-20 cm. Aboveground biomass is not included.	Changes in C-stocks were calculated using the area and rates of annual C-gain. [MISC. 6/Add. 1, p. 77]	
	Cropland conversion to grassland					Only data are provided.
	Grassland management					Data and information are provided
	Increased use of wood products and other long term wood materials	AB	No information	No specified.	Estimation based on extrapolation of "End-use of wood products"	Only data are provided.

Table 4 (b) *(continued)*

Party	Activities	Information provided on				
		Accounting approaches		Carbon pools	Methods	Projections
		AB/ LB	Additional explanations			
United Kingdom	Forest management	LB	All but some 300 kha of the UK's 2.3 Mha forest estate is managed and is accumulating carbon. The increase in carbon stock in forests planted since 1990 is reported here in Table I.A under Article 3.3 of the Kyoto Protocol and the difference between this amount and that in the GHG Inventory is entered here in Table III.A (under forest management). These values therefore refer to the accumulation in carbon on the standing forest area in 1990 for periods subsequent to that date up to the end of the I CP. [MISC. 6, p. 224]	Not specified.	The methods used for calculating the uptake of carbon by the UK forest stock are described in Milne et al (1998) and Cannell et al (1999). [MISC. 6, p. 224]	Only data are provided.
	Bioenergy crop production	LB	The data show only enhanced soil carbon uptake in arable land planted with short rotation coppice (SRC), assuming the same accumulation of SOC under short-rotation woody bioenergy crops as seen under natural woodland regeneration (1.17% y-1; see Smith et al 2000). MISC. 6, p. 224]	Not specified.	No information is provided.	
United States	Forest management	LB	The accounting approach is a broad, land-based approach in which the total managed land areas for each category are included. All net carbon removals associated with these activities are accounted for by estimating changes in carbon stocks from the beginning to the end of the period. [MISC. 6/Add. 1, p. 129]	As in table 1.B Carbon in dead wood in the forest is not currently included; estimates of this pool are under construction.	Data analysis and models, see Table 2.b	Data (only on carbon change) and key assumption are provided. Trends beyond the first commitment period are given.
	Cropland management			Carbon stock changes in the top 30 cm of soil	IPCC and models [MISC. 6/Add. 1, p. 133]	
	Grazing land management					

[h] We have used a variety of assumptions and currently available data to derive the estimates shown in Table III, but we emphasize that these approaches do not reflect the systems that Canada proposes to use to measure and monitor additional activities. These proposed systems currently are being assessed and will be implemented as required once decisions have been made on what is acceptable.

[i] No difference in the reported values.

Table 4 (c): Definitions of activities proposed under Article 3.4

Party	Activity	Definition
Australia	Revegetation activities	Revegetation is defined as the human induced establishment of woody vegetation that covers a minimum area of 0.5 hectare with a minimum width in any direction of 10 metres and does not meet the definitions of afforestation or reforestation under Article 3. Eligible revegetation activities include: – the establishment of woody vegetation to address sustainable land management; – windbreaks and shelterbelts; – environmental plantings or fencing off areas of native vegetation; – agroforestry planting of trees or the development of new tree crop products such as tea tree oil to encourage a more diversified and sustainable production system that leads to social, economic and environmental benefits for land users; and – changes in stock management practices to encourage regeneration of vegetation.
Canada	Forest management	For the purposes of Article 3.4, forest management is the broad set of management activities in the forest related to multiple use values including timber, which is the forest use of greatest significance for carbon stock changes.
	Cropland management	Cropland refers to land that produces annual field crops (grains, oilseeds, pulses, and potatoes) for harvest or green manure, as well as summerfallow land. Summerfallow, 'idle land' in the agricultural census, is cropland that is not seeded to a crop for one growing season, and on which chemical or tillage weed control practices are used. The practice of summerfallow is used in the most arid regions of the prairies to store soil moisture for the succeeding crop. Statistics Canada defines zero tillage as a practice with "no tillage prior to seeding" that includes direct seeding into stubble or sod, and ridge tilling. Minimum tillage is defined as "tillage prior to seeding that retains most of the crop residue on the surface" (Statistics Canada). Conventional cropping systems are any other systems in which tillage incorporates most of the crop residue into the soil. (Statistics Canada).
	Grazing land management and livestock	Grazing land management applies to land used for livestock production (hayland, improved and natural pasture) and includes estimates of direct and indirect emissions from the associated animals. Hayland is alfalfa and alfalfa mixtures or other tame hay cut for hay or silage. Improved pasture includes land that has been cultivated and seeded, or drained, irrigated, fertilized, or controlled for weeds or brush. Natural pasture includes native pasture, native hay, and rangelands (Statistics Canada).
	Shelterbelt	Carbon sequestration from the planting of trees and shrubs on agricultural land in the form of shelterbelts on the Prairies was also assessed.
Finland	Forest management (including forest conservation)	Forest management is considered as a broad activity, and it includes forest conservation.

Table 4 (c) *(continued)*

Party	Activity	Definition
France	Forest management in state forests	Forest management in State forests which had an approved management plan in 1990;
	Forest management in other public forests	Forest management in other public forests which had an approved management plan in 1990;
	Forest management in private forests	Forest management in private forests which had an approved management plan in 1990;
	Conversion of mixed coppice/high forest stands into high forests	Conversion of mixed coppice/high forest stands into high forests;
	Enhancement of carbon sink in wood products (except for paper and paper board)	Enhancement of carbon sink in wood products in France (except for paper and paper board)
Germany	Forest management	The activity comprises the sustainable multipurpose management of forests for wood and non-wood goods and services, protection and recreation. Typically, production, protection and recreation aims are reached through sustainable management on the same area. Carbon sequestration is only one of the multiple functions of sustainable managed forests.
Iceland	Revegetation	Direct human activity to increase carbon stocks in above- and below-ground biomass and in soils on sites with minimal vegetative cover and low organic matter content.
Italy	Activities to prevent carbon emissions	Fire prevention. (No further definition provided)
	Conversion of grazing lands to forest	As a consequence of a clear commitment made by the European Community and the national authorities to reduce the price protection policy for many agricultural products, marginal agricultural land is abandoned and naturally converted to forestland. This is not a "natural" process, being linked to Common Agricultural Policy reform, to a new model of rural development based on a multi-sectoral economy (tourism and recreation, handicraft, high quality agricultural products for niche market, timber production, etc.).
Japan	Forest management	Activities to establish healthy and vital forests, in order to develop and enhance various functions of forests comprehensively, and to assure national land conservation, prevent disasters and provide a comfortable environment.More specifically, the activities include plantation, regeneration assisting practices such as surface scarification and brush cutting, weeding, clean-cutting among others.
	Urban greening	Activities in planting trees on the urban parks, roads, rivers, etc., sewage-disposal plants, facilities for government and other public offices, public housing, among others

Table 4 (c) *(continued)*

Party	Activity	Definition
Netherlands	Forest management	This management includes thinning and normal harvest and regeneration cycle. Most of the forest area has been managed in even-aged stands as monocultures in regular rotations of 60 to 100 years. Managed is changing towards stand which are uneven-aged and mixes and more selective cutting and longer rotations (80-120 years). Management today does hardly include any drainage of sites or fertilization or liming except in cases of restoration of nutrient balances following acidification and/or eutrification. Forest fires are rare and management does not include pest control.
	Cropland management	Improved cropland management includes reduced tillage (more shallow and less frequent), improved management and application of crop residues (aimed at reducing the loss of residue N and thus of C), less bare-fallow (introducing cover crops), increased ley-arable farming on former arable land (as a result of expanding the area where biological farming principles are applied and no mineral fertilizer is applied).
	Grazing land management	According to the EU definition, permanent grassland is grassland that is not in rotation and that is continuous grassland for 5 or more consecutive years. In the Netherlands, a large area of grassland is regularly subject to ploughing and reseeding to maintain productivity and introduce new and more productive grass varieties. This practice would qualify as grassland management. This practice requires additional nitrogen fertilization to compensate for the nitrogen lost. In the Netherlands, peatlands are often covered by grazing land. Drainage management is very important on these areas. Measures for improved grazing land management would include reducing the area and intensity of improving grassland productivity through ploughing and reseeding and replace with a practice where reseeding is done without ploughing "old" and permanent grassland or where ploughing and re-seeding is applied in spring and not in autumn.
Norway	Increased fertilization	In Norway the fertilised area on mineral soil the last years accounts to about 2000 ha per year. We have estimated that it would be technically possible to increase the fertilised area to about 35,000 ha per year, and this is described further in the following. The increased nitrogen fertilisation described is implemented only in older forests (cutting class IV and V), where the effects on carbon stocks are highest. Fertilisation in younger forest (cutting class II and III) can give increased increment, but this activity is excluded because of the controversy with regard to possible environmental effects and the long period of economic return.
Spain	Activity 1	No definition is provided.
Sweden	Forest management	Broad activity
	Forest conservation	Narrow activity. Areas are well-defined and protected by legal means without time limits.

Table 4 (c) *(continued)*

Party	Activity	Definition
Switzerland	Establishment of carbon forests and forest re-serves to increase carbon stock	No definition is provided.
	Cropland management	Key practice is conservation tillage
	Cropland conversion to grassland	Key practice is conversion of cropland to grassland
	Grassland management	Management change from intensive hay/pasture to extensively managed, low input grassland.
	Increased use of wood products and other long term wood materials	No definition is provided.
United Kingdom	Forest management	No definition is provided.
	Bioenergy crops	No definition is provided.
United States	Forest management	Forest management is an activity involving the regeneration, tending, protection, harvest, access and utilization of forest resources to meet goals defined by the forest landowner. "Managed forests" are also known in the U.S. as timberlands. They are defined in the U.S. database as those lands which are capable of producing at least 1.4 $m^3 ha^{-1} yr^{-1}$ of industrial wood under natural conditions and are not reserved for purposes other than timber production. For example, timberlands do not include parks, wilderness, recreation areas, wildlife preserves, or other forests that are inaccessible or otherwise not available or appropriate for wood production.
	Cropland management	Cropland includes all land on which agricultural field crops are grown. This includes annual crop production, perennial crop production such as hay, and land that is still considered agricultural land but is not currently being used for crop production (e.g. set-aside and Conservation Reserve Program). All cropland is considered as managed for purposes of food and fiber production, using a variety of practices including crop selection and rotation, tillage, manuring, fertilization, irrigation, harvest and residue management.
	Grazing land management	Grazing land is defined by the Society for Range Management as: "a collective term that includes all lands having plants harvested by grazing without reference to land tenure or other land-uses, management, or treatment practices." Grazing land includes all land on which the primary productive use is for herbivore grazing, including permanent (or long-term) pasture and rangeland. Grazing land management encompasses all practices aimed at manipulating the amount and type of forage and livestock produced, including regulation of animal stocking rates, forage species selection, fertilization, liming and irrigation. Our definition for grazing land does not include forested land that is grazed or land used primarily for annual crops or hay production that may be seasonally grazed.

Annex

FORMATS FOR THE SUBMISSION DUE ON 1 AUGUST 2000 OF PRELIMINARY, COUNTRY-SPECIFIC DATA AND INFORMATION BY ANNEX I PARTIES FOR PROPOSALS RELATED TO ARTICLE 3.3 AND 3.4 OF THE KYOTO PROTOCOL

This annex provides formats for the submission due on 1 August 2000 of preliminary, country-specific data and information on proposals by Annex I Parties for activities related to Article 3.3 and 3.4 of the Kyoto Protocol. These formats, together with any rules, modalities or guidelines adopted for this annex, or the data and information that will be submitted by Parties using this annex, by no means prejudge decisions or conclusions that may be made by either the Conference of the Parties (COP) or the Subsidiary Body for Scientific and Technological Advice (SBSTA) at future sessions.

The terms and abbreviations used throughout this annex refer to the definitions given in the Intergovernmental Panel on Climate Change (IPCC) *Special Report on Land-Use, Land-Use Change and Forestry* in table 3-1, on pages 130-131 (definitional scenarios) and the section "Land-Based versus Activity-Based Accounting" on pages 130-131 (accounting approaches). For example, the abbreviation "FAO" refers to a definitional scenario where: "A forest refers to a land that has, or will have because of continued growth, more than 10% canopy cover; deforestation is a decline of canopy cover to below 10%, but excludes changes within the forest class; reforestation is artificial establishment of forest on lands that had them previously (including regeneration post-harvest); afforestation is artificial establishment of forest on lands that were not historically forest."

When completing the annex, Parties may modify the definitional scenarios or accounting approaches or use country-specific definitions or approaches. In such cases where the definitions or approaches deviate from those provided by the IPCC Special Report, this should be clearly stated and the applied definitions and/or approaches must be explained in the explanatory text that must accompany each table.

In its submission the Annex I Party should complete those portions of tables I and III that directly relate to its preferred proposals. Furthermore, the Annex I Parties may provide data and information in relation to other options using tables I and III.

Table I - Preliminary data and information provided by Annex I Party on carbon stock changes and areas related to Article 3.3 activities

Article 3.3 Country specific data	Definitions	Accounting framework	a_I (ha)	ΔC_I (t C)	a_{II} (ha)	ΔC_{II} (t C)	a_{cp} (ha)	ΔC_{cp} (t C)	Methods and approaches	Data sources, data quality, and uncertainty (e.g. ranges)	Other information relevant to decision-making
Afforestation Reforestation	IPCC	Activity based									
		Land based									
Afforestation	FAO	Activity based									
		Land based									
Reforestation	FAO	Activity based									
		Land based I									
		Land based II									
Afforestation Reforestation	Other	Activity based									
		Land based									
Deforestation	IPCC/FAO	Activity based									
		Land based									
	Other	Activity based									
		Land based									

a_I Area (ha) afforested and reforested, or deforested since 1990 up to 1995 or possibly an earlier specific year.

ΔC_I Carbon stock change (t C) since 1990 up to the same year as used in a_I on land afforested, reforested, and deforested.

a_{II} Area (ha) afforested and reforested, or deforested since 1990 up to 1999 or an earlier specific year.

ΔC_{II} Carbon stock change (t C) since 1990 up to the same year as used in a_{II} on land afforested, reforested, and deforested.

a_{cp} Projected area (ha) afforested and reforested, or deforested since 1990 up to 2012.

ΔC_{cp} Projected carbon stock change (t C) over the first commitment period on land afforested, reforested, and deforested since 1990 up to 2012.

Methods and approaches

Specify:

a) Forest definition used;

b) Definitions for afforestation, reforestation and deforestation used;

c) Applied accounting approaches;

d) Included carbon pools;

e) Other.

EXPLANATORY TEXT (table I)

Parties should submit information under all headings listed below where the information is relevant to the approach taken in their submission and to the extent that data and methodologies exist.

1. Definitions and accounting:
    a) Forest,
    b) Afforestation, reforestation, and deforestation,
    c) Accounting approaches.

2. Carbon pools included (e.g. above-ground biomass, litter and woody debris, below-ground biomass, soil carbon, and harvested materials);

3. Stratification (e.g. biomes and regions);

4. Methodologies and data:
    a) Data sources,
    b) Sampling techniques,
    c) Models and key parameters,
    d) Uncertainties.

5. Treatment of non-CO_2 greenhouse gases.

6. Methods and key assumptions in projections for the first commitment period (2008–2012) and discussion, if possible, of trends beyond the first commitment period.

Table II - Preliminary data and information provided by Annex I Party on carbon stocks and area estimates (First sentence of Article 3.4)

Land system	*Area (ha)*	*Carbon stock in 1990 (t C)*
Forestry lands		
Agricultural lands		
Rangelands/grasslands		
Wetland/tundra		
Other		
Total (as listed above)		

EXPLANATORY TEXT (table II)

Parties should submit information under all headings listed below where the information is relevant to the approach taken in their submission and to the extent that data and methodologies exist.

1. Description of land categories, including any land categories not covered.

2. Carbon pools - distinctions and assumptions.

3. Data sources.

4. Methods.

5. Possible changes in carbon stocks.

6. Uncertainties.

Table III - Preliminary data and information provided by Annex I Party on Article 3.4 activities, related net GHG emissions, involved areas, and projected carbon stock changes (additional activities under Article 3.4)

Article 3.4 Country specific data	Accounting framework	a_i (ha)	$CO_{2,i}$ (t CO_2)	$CH_{4,i}$ (t CO_2 equivalent)	N_2O_i (t CO_2 equivalent)	a_0 (ha)	$CO_{2,0}$ (t CO_2)	$CH_{4,0}$ (t CO_2 equivalent)	N_2O_0 (t CO_2 equivalent)	$\Delta C_{B,i}$ (t C)	$\Delta C_{DOM,i}$ (t C)	$\Delta C_{B,0}$ (t C)	$\Delta C_{DOM,0}$ (t C)	$\Delta C_{HWP,i}$ (t C)	$\Delta C_{HWP,0}$ (t C)	Net emissions/ removals (t CO_2)	Net emissions/ removals (t CO_2 equivalent)
Activity 1	Land-based																
	Activity-based																
Activity 2	Land-based																
	Activity-based																
Activity 3	Land-based																
	Activity-based																

• These columns would contain the sum over the years concerned of net annual emissions by sources and removals by sinks for the Article 3.4 activities proposed. A negative sign indicates either emissions by sources or a decrease in carbon stocks. A positive sign indicates either removals by sinks or an increase in carbon stocks.

To convert a carbon amount to CO_2, multiply it by 3.67.

[1] CH_4 and N_2O emissions are converted to CO_2 equivalent emissions by using the global warming potential (GWP) values of 21 for CH_4, and 310 for N_2O (Source: Second Assessment Report of the IPCC, 1995).

a_i Area (ha) in 1995 or possibly an earlier specific year involved in the Article 3.4 activity since 1990.

$CO_{2,i}$ Net CO_2 emissions (t CO_2) by sources and removals by sinks related to the Article 3.4 activity, accumulated from 1990 to the same year as used in a_i.

$CH_{4,i}$ CH_4 emissions (t CO_2 equivalent) by sources related to the Article 3.4 activity, accumulated from 1990 to the same year as used in a_i.

N_2O_i N_2O emissions (t CO_2 equivalent) by sources related to the Article 3.4 activity, accumulated from 1990 to the same year as used in a_i.

a_0 Area (ha) in 1990 or possibly an earlier specific year involved in the Article 3.4 activity since 1990.

$CO_{2,0}$ Net CO_2 emissions (t CO_2) by sources and removals by sinks related to the Article 3.4 activity, accumulated from 1990 to the same year as used in a_0.

$CH_{4,0}$ CH_4 emissions (t CO_2 equivalent) by sources related to the Article 3.4 activity, accumulated from 1990 to the same year as used in a_0.

$N_2O_{,\,ll}$ N_2O emissions (t CO_2 equivalent) by sources related to the Article 3.4 activity, accumulated from 1990 to the same year as used in a_{ll}.

a_{cp} Projected area (ha) in 2012 involved in the Article 3.4 activity since 1990.

ΔC_{cp} Projected carbon stock changes (t C) over the first commitment period related to the Article 3.4 activity since 1990.

$CO_{2,\,cp}$ Projected net CO_2 emissions related contribution (t CO_2) of the Article 3.4 activity to the first commitment period assigned amount of the Party.

$CH_{4,\,cp}$ Projected CH_4 emissions related contribution (t CO_2 equivalent) of the Article 3.4 activity to the first commitment period assigned amount of the Party.

$N_2O_{,\,cp}$ Projected N_2O emissions related contribution (t CO_2 equivalent) of the Article 3.4 activity to the first commitment period assigned amount of the Party.

Meth[illegible] and approaches

Spec[illegible] a) Whether the definition of activity is considered broad or narrow (cf. Section 4.3.2. page 195 of the IPCC Special Report);
b) How the estimates were computed;
c) Other.

EXPLANATORY TEXT (table III)

Parties should submit information under all headings listed below where the information is relevant to the approach taken in their submissions and to the extent that data and methodologies exist.

1. Activities and accounting:
   a) Definitions and descriptions of all activities proposed,
   b) Scope of activities and how they fit into broader managed land categories,
   c) Accounting approaches,
   d) Proposals for key accounting features, e.g. assumptions on baselines, basis for the area estimates covered by activity.
2. Carbon pools included (e.g. above ground biomass, litter and woody debris, below-ground biomass, soil carbon, and harvested materials).
3. Methodologies and data:
   a) Data sources,
   b) Sampling techniques,
   c) Models and key parameters,
   d) Uncertainties.
4. Treatment of non CO_2 greenhouse gases.
5. Methods and key assumptions in projections for the first commitment period (2008–2012) and discussion, if possible, of trends beyond the first commitment period.

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